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INDIAN POINT NUCLEAR POWER STATION: VERIFICATION  
ANALYSIS OF COUNTY RADIOLOGICAL  
EMERGENCY-RESPONSE PLANS

by

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Energy and Environmental Systems Division  
Integrated Assessments and Policy Evaluation Group

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## 1 INTRODUCTION

## 1.1 PURPOSE AND SCOPE OF THE ANALYSIS

This report was developed as a management tool for use by the Federal Emergency Management Agency (FEMA) Region II staff. The analysis summarized in this report was undertaken to verify the extent to which procedures, training programs, and resources set forth in the County Radiological Emergency Response Plans (CRERPs) for Orange, Putnam, and Westchester counties in New York had been realized prior to the March 9, 1983, exercise of the Indian Point Nuclear Power Station near Buchanan, New York. To this end a telephone survey of county emergency response organizations was conducted between January 19 and February 22, 1983. Nine categories of emergency response organizations were contacted:

- Bus companies,
- Reception centers,
- Congregate care centers,
- Public schools within the 10-mile plume exposure emergency planning zone (EPZ) to be evacuated,
- Nonpublic schools, nursery schools, and day care centers within the EPZ to be evacuated,
- School districts within the EPZ to be evacuated,
- Hospitals and nursing homes within the EPZ to be evacuated,
- Hospitals capable of treating radiologically contaminated patients, and
- Ambulance companies.

This report presents the results of responses obtained from this survey of county emergency response organizations.

Time, manpower, and financial constraints prohibited a comprehensive survey of all the emergency response organizations with responsibilities assigned in the CRERPs. Therefore emergency response organizations within the nine categories listed above were sampled randomly instead. Emergency response organizations designated in CRERPs that were available on January 19, 1983, were inventoried and lists of organizations to be contacted by telephone were then randomly sampled from these inventories.

At the time of the verification analysis, Rockland County had not adopted a radiological emergency preparedness plan. For this reason, Rockland County was not included in this study.

## 1.2 SELECTION OF SAMPLES

The following guidelines were used to determine the size of the sample taken for each category of emergency response organization within each county\*:

| <u>No. of Organizations</u> | <u>Sample size</u>                                      |
|-----------------------------|---|
| 1                           | 1   |
| 2-4                         | 2   |
| 5-6                         | 3   |
| 7-20                        | 4   |
| 21-54                       | 5   |
| 55 and up                   | 10% of organizations<br>(rounded to nearest<br>integer) |

These guidelines were constructed with the help of FEMA Region II staff. The guidelines were influenced by the time, manpower, and financial constraints mentioned above. As the number of organizations in a category decreases, a larger percentage of the total must be included in the sample to adequately estimate the parameters (variables) under study. Accordingly, the proportion of organizations sampled ranges from 100% (where the organizations of interest number two or less) to 10% (where the organizations of interest number 50 or greater). To avoid introducing undue bias into the sample, a simple randomizing technique was used to select the emergency response organizations to be sampled.

## 1.3 SURVEYING PROCEDURES

The questionnaires used in the verification analysis were developed by FEMA Region II staff with the assistance of personnel from Argonne National Laboratory. These questionnaires can be found in Appendix A. Argonne National Laboratory personnel telephoned each sampled emergency response organization and queried the person in charge of the organization or that person's representative.

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\*All bus companies and hospitals capable of treating radiologically contaminated patients were surveyed.

Of the 98 emergency response organizations randomly selected to be sampled, 25 responded to the survey. The other emergency response organizations either declined to answer any questions, were not available for comment, or did not respond for other reasons.

#### 1.4 SIGNIFICANCE OF THE RESULTS

Table 1 summarizes the population (number of organizations in a category) and sample sizes for the study. The statistical significance of the responses to selected questions is included in Sec. 2. Confidence intervals and confidence levels are calculated for responses that were considered to be the most important, including responses on the training of emergency response personnel, the level of involvement with state and county authorities, and other particularly relevant topics. For example, where one out of five schools sampled from a population of 36 schools (see Table 1 and Table 6, question 4 for Westchester County) had been trained in evacuation procedures, the confidence interval is the range 0.03 to 0.56 for the proportion trained, and the confidence level is 89%. A more detailed description of the confidence intervals and their selection is included in Appendix B.

Table 1 Population and Sample Sizes

| Facility Type   | Westchester Co. |             |                                | Putnam Co.      |             |                                | Orange Co.      |             |                                | All Counties    |             |                                |
|---|-----------------|-------------|--------------------------------|-----------------|-------------|--------------------------------|-----------------|-------------|--------------------------------|-----------------|-------------|--------------------------------|
|   | Population Size | Sample Size | Completed Surveys <sup>a</sup> | Population Size | Sample Size | Completed Surveys <sup>a</sup> | Population Size | Sample Size | Completed Surveys <sup>a</sup> | Population Size | Sample Size | Completed Surveys <sup>a</sup> |
| Bus companies   | 7               | 7           | 5                              | 5               | 5           | 3                              | 3               | 3           | 1                              | 15              | 15          | 9                              |
| Reception centers   | 39              | 5           | 4                              | 6               | 3           | 3                              | 8               | 4           | 4                              | 53              | 12          | 11                             |
| Congregate care relocation centers                                      | 77              | 8           | 8                              | 30              | 5           | 5                              | 12              | 4           | 4                              | 119             | 17          | 17                             |
| Public schools within the EPZ   | 41              | 5           | 4                              | 4               | 2           | 2                              | 5               | 3           | 3                              | 50              | 10          | 9                              |
| Nonpublic schools, nursery schools, and day care centers within the EPZ | 36              | 5           | 5                              | 3               | 2           | 2                              | 2               | 2           | 2                              | 41              | 9           | 9                              |
| School districts within the EPZ   | 8               | 4           | 4                              | 3               | 2           | 2                              | 2               | 2           | 2                              | 13              | 8           | 8                              |
| Hospitals and nursing homes within the EPZ                              | 20              | 4           | 4                              | 2               | 2           | 2                              | 1               | 1           | 1                              | 23              | 7           | 7                              |
| Hospitals treating radio-logically contaminated patients                | 3               | 3           | 3                              | 1               | 1           | 1                              | 2               | 2           | 2                              | 6               | 6           | 6                              |
| Ambulance companies   | 51              | 5           | 4                              | 11              | 4           | 4                              | 27              | 5           | 4                              | 89              | 14          | 12                             |

<sup>a</sup>The number of surveys actually completed is smaller than the number in the sample because some organizations elected not to respond to questions over the telephone or could not be contacted despite repeated attempts.



## 2 RESULTS OF THE SURVEY

Of the total 409 emergency response organizations with responsibilities assigned in the CRERPs, 98 were included in the sample. However, the number of surveys actually completed is smaller than the number of emergency organizations selected for the sample because some organizations elected not to respond to questions over the telephone or could not be contacted despite repeated attempts. The analysis that follows is based on the 88 completed interviews.

The following results are organized by type of emergency response organization. For each type of organization, a narrative summary presents results for the three counties combined and then for each county separately. Following this narrative is a table that contains the numerical results of each question asked.

### 2.1 BUS COMPANIES

Nine bus companies -- 60% of the companies listed in the CRERPS -- responded to the survey. Of these nine companies,

- Seven (78%) had been contacted by the state or county concerning the CRERP,
- Five (55%) had garages located within the EPZ,
- One (11%) had at least one driver who had been trained in radiological emergency response preparedness, and
- Two (22%) had such training scheduled.

Table 2 lists the numerical results of the bus company survey.

#### Orange County

Three bus companies in Orange County are designated to assist in an evacuation, and all three were included in the sample. The CRERP, however, is organized so that one company is responsible for contacting the other two companies. The survey respondent at the company responsible for contacting the other two companies was not aware of this system. Argonne personnel were unable to contact the other two companies. The one company that was questioned had been contacted by the county concerning the CRERP. Personnel at this company had not received any training for radiological emergency response preparedness, but such training was scheduled. The company did not have information on evacuee pick-up locations or dosimeters available for drivers.

Table 2 Results of the Survey of Bus Companies

| 2a. How many buses do you have in your garage?  |               |               |                    |                     |
|---|---------------|---------------|--------------------|---------------------|
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 65            | 17-163        | 10-250             | 10-250              |
| Mean  | 65            | 78            | 84                 | 80                  |
| 2b. How many vans do you have in your garage?   |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 2             | 8-20          | 0-23               | 0-23                |
| Mean  | 2             | 16            | 12                 | 12                  |
| 3a. On an average day, how many buses do you have in working condition?                             |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 63            | 15-147        | 10-225             | 10-225              |
| Mean  | 63            | 70            | 80                 | 75                  |
| 3b. On an average day, how many vans do you have in working condition?                              |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 2             | 8-18          | 0-18               | 0-18                |
| Mean  | 2             | 14            | 11                 | 11                  |
| 4a. What is the average capacity of the buses that you have in working condition on an average day? |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 43            | 60-77         | 42-66              | 42-77               |
| Mean  | 43            | 67            | 58                 | 59                  |
| 4b. What is the average capacity of the vans that you have in working condition on an average day?  |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 8             | 7-15          | 12-16              | 7-16                |
| Mean  | 8             | 11            | 15                 | 12                  |
| 5. How many of your vehicles are equipped to transport handicapped, non-ambulatory individuals?     |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 0             | 2-9           | 0-86               | 0-86                |
| Mean  | 0             | 5             | ---                | ---                 |

Table 2 (Cont'd)

| 6. How many licensed bus and van drivers do you employ?   |                |                |                    |                     |
|---|----------------|----------------|--------------------|---------------------|
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 80             | 25-225         | 30-316             | 25-316              |
| Mean  | 80             | 107            | 115                | 108                 |
| 7. How many vehicles do you use on an ordinary daily basis when schools are in session?   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 61             | 23-180         | 22-220             | 22-220              |
| Mean  | 61             | 92             | 80                 | 82                  |
| 8. How many vehicles do you use on an ordinary daily basis when schools are not in session? (weekends, vacation, summer, etc.)  |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 13             | 0-13           | 0-196              | 0-196               |
| Mean  | 13             | 5              | ---                | ---                 |
| 9. Approximately how many vehicles are equipped with mobile communications equipment?   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 67             | 8-183          | 0-118              | 0-183               |
| Mean  | 67             | 79             | 44                 | 58                  |
| 10. Have you or someone in your organization been contacted by state or county representatives to discuss your role in the Indian Point Radiological Emergency Response Plan? |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 1 <sup>a</sup> | 2 <sup>b</sup> | 4 <sup>c</sup>     | 7 <sup>d</sup>      |
| No  | 0              | 0              | 1                  | 1                   |
| Don't know  | 0              | 1              | 0                  | 1                   |
| 10a. If yes, when was the company contacted regarding the plan?   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| 1983  | 0              | 1              | 0                  | 1                   |
| 1982  | 1              | 1              | 2                  | 4                   |
| 1981  | 0              | 0              | 1                  | 1                   |
| Don't know  | 0              | 0              | 2                  | 2                   |

Table 2 (Cont'd)

|   |                |                |                    |                     |
|---|----------------|----------------|--------------------|---------------------|
| 12. Who would contact you and tell you to deploy your vehicles in the event an evacuation became necessary?   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| County  | 0              | 0              | 3                  | 3                   |
| Superintendent of schools   | 1              | 2              | 2                  | 5                   |
| Civil defense   | 0              | 1              | 0                  | 1                   |
| 13. How would you be contacted? (e.g., telephone, radio, etc.)  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Telephone   | 0              | 2              | 5                  | 7                   |
| Don't know  | 1              | 1              | 0                  | 2                   |
| 14. How would you notify your vehicle drivers to report to the garage in the event they were needed for an evacuation? <sup>e</sup>                       | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Telephone   | 1              | 3              | 4                  | 8                   |
| Radio   | 0              | 1              | 3                  | 4                   |
| 15. Is your garage located within the 10-mile Emergency Planning Zone?  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 1 <sup>f</sup> | 1              | 3                  | 5 <sup>f</sup>      |
| No  | 1 <sup>f</sup> | 2              | 2                  | 5 <sup>f</sup>      |
| 16. If the garage is within the EPZ, how will you communicate with your drivers if there is a total evacuation and your dispatcher must leave the garage? | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Radio   | 0              | 0              | 3                  | 3                   |
| Don't know  | 0              | 1              | 0                  | 1                   |
| Move headquarters   | 1              | 0              | 0                  | 1                   |
| 17. Do you have maps or lists of evacuee pick-up locations available for distribution to your vehicle drivers?  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 0 <sup>g</sup> | 1 <sup>h</sup> | 4 <sup>c</sup>     | 5 <sup>i</sup>      |
| No  | 1              | 2              | 1                  | 4                   |

Table 2 (Cont'd)

---

|  |                |                |                    |                     |
|--|----------------|----------------|--------------------|---------------------|
| 18. How many of your vehicle drivers have received formal training in radiological emergency response preparedness (including dosimetry, evacuation routes, etc.)? | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| One driver   | 0 <sup>g</sup> | 0 <sup>j</sup> | 1 <sup>k</sup>     | 1 <sup>l</sup>      |
| No drivers   | 1              | 3              | 4                  | 8                   |
| 19. Are your vehicle drivers scheduled to receive radiological emergency response training in the future?  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 1              | 1              | 0                  | 2                   |
| No   | 0              | 2              | 5                  | 7                   |
| 20. How many dosimeters do you have available for distribution to your drivers?  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| One dosimeter  | 0              | 0              | 1                  | 1                   |
| No dosimeters  | 1              | 3              | 3                  | 7                   |
| Don't know   | 0              | 0              | 1                  | 1                   |

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<sup>a</sup>Confidence interval = (0.33, 1.00), confidence level = 100%.

<sup>b</sup>Confidence interval = (0.40, 0.80), confidence level = 100%.

<sup>c</sup>Confidence interval = (0.57, 0.85), confidence level = 100%.

<sup>d</sup>Confidence interval = (0.60, 0.87), confidence level = 88%; confidence interval = (0.47, 0.87), confidence level = 100%.

<sup>e</sup>Multiple responses were given by same companies.

<sup>f</sup>One company had garages located both within and outside the EPZ.

<sup>g</sup>Confidence interval = (0.00, 0.67), confidence level = 100%.

<sup>h</sup>Confidence interval = (0.20, 0.60), confidence level = 100%.

<sup>i</sup>Confidence interval = (0.40, 0.73), confidence level = 83%; confidence interval = (0.33, 0.73), confidence level = 100%.

<sup>j</sup>Confidence interval = (0.00, 0.40), confidence level = 100%.

<sup>k</sup>Confidence interval = (0.14, 0.43), confidence level = 100%.

<sup>l</sup>Confidence interval = (0.07, 0.27), confidence level = 86%; confidence interval = (0.07, 0.47), confidence level = 100%.

Putnam County

Of the five bus companies chosen to be surveyed in Putnam County, the respondent at one refused to answer questions without compensation and surveyors were not able to contact a second company. Two of the remaining companies that completed the survey had been contacted by the state or county concerning the CRERP. None of these three companies had personnel trained in radiological emergency response preparedness, but one indicated that such training was scheduled. One company had information on evacuee pick-up locations available for drivers. No companies had dosimeters available for drivers.

Westchester County

Seven bus companies in Westchester County were included in the CRERP and all were selected to be surveyed. Argonne surveyors were unable to contact one company, and another company refused to answer the questionnaire. Four of the five companies that completed the survey had been contacted by the state or county concerning the CRERP. The survey indicated that one driver in one company had been trained in radiological emergency response preparedness. No training sessions were scheduled for any company. Four companies had information on evacuee pick-up locations available for drivers, and one had dosimeters available for drivers.

## 2.2 RECEPTION CENTERS

Twelve of the 53 facilities designated to serve as reception centers were included in the sample, and 11 responded to the survey. Of these facilities,

- All (100%) were schools, and
- Seven (78%) had plans for students if the buildings were to be used as reception centers.

Nine (82%) of the respondents were aware that their buildings were designated as reception centers, but none knew who would be in charge of reception center operations. Table 3 lists the questions and numerical results of the reception center survey.

Orange County

Respondents at all four of the schools sampled in Orange County were aware that their buildings had been designated as reception centers. One respondent knew who would notify the school if it became necessary to activate the building as a reception center. None of the respondents knew who would be in charge of reception center operations. Three of the schools had plans (e.g., dismissal of school) for the students if the buildings were to be used as reception centers.

Table 3 Results of the Survey of Reception Centers

|  |                |                |                    |                     |
|--|----------------|----------------|--------------------|---------------------|
| 1. Are you aware that your building is designated as a Reception Center in the Indian Point Radiological Emergency Response Plan?  |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 4 <sup>a</sup> | 3 <sup>b</sup> | 2 <sup>c</sup>     | 9 <sup>d</sup>      |
| No   | 0              | 0              | 2 <sup>e</sup>     | 2 <sup>e</sup>      |
| 2. Who would notify you that your building is to be activated as a Reception Center?   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Superintendent   | 1              | 0              | 1                  | 2                   |
| Don't know   | 3              | 3              | 1                  | 7                   |
| 3. How would you be notified that your building is to be activated as a Reception Center?  |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Telephone  | 2              | 1              | 1                  | 4                   |
| Don't know   | 2              | 2              | 1                  | 5                   |
| 4. Is your building utilized 12 months a year?   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2              | 3              | 2                  | 7                   |
| No   | 2              | 0              | 0                  | 2                   |
| 5. Who is authorized to open the building after working hours (and weekends, vacations, summers if applicable) in case it is needed as a Reception Center during a Radiological Emergency? |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Custodian  | 2              | 1              | 1                  | 4                   |
| Principal  | 0              | 1              | 0                  | 1                   |
| Superintendent   | 1              | 1              | 0                  | 2                   |
| Other  | 1              | 0              | 1                  | 2                   |
| 6. Is there a backup person name available in case the regular person isn't available?   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 4              | 3              | 1                  | 8                   |
| No   | 0              | 0              | 1                  | 1                   |

Table 3 (Cont'd)

| 7. What is the normal daily occupancy of your building?   |         |               |               |                    |                     |
|---|---------|---------------|---------------|--------------------|---------------------|
|   |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   |         | 660-2400      | 400-1850      | 80-750             | 80-2400             |
| Mean  |         | 1343          | 883           | 415                | 983                 |
| 8. What is the capacity of your parking lot? (automobiles)  |         |               |               |                    |                     |
|   |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   |         | 75-100        | 40-50         | 80-300             | 40-300              |
| Mean  |         | 103           | 45            | 190                | 82                  |
| 9. Are there showers in your building?  |         |               |               |                    |                     |
|   |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes   |         | 3             | 2             | 2                  | 7                   |
| No  |         | 1             | 1             | 0                  | 2                   |
| 9a. How many showers are there in the building? <sup>f</sup>  |         |               |               |                    |                     |
|   |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Male  | { Range | 7-15          | ---           | 1-6                | ---                 |
|   | { Mean  | 11            | ---           | 4                  | ---                 |
| Female  | { Range | 0-15          | ---           | 2-6                | ---                 |
|   | { Mean  | 8             | ---           | 4                  | ---                 |
| Male or Female  | { Range | ---           | 6-10          | ---                | ---                 |
|   | { Mean  | ---           | 8             | ---                | ---                 |
| 10. Approximately how many toilets are there in the building?   |         |               |               |                    |                     |
|   |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Male  | { Range | 11-35         | 10-35         | 6-10               | 6-35                |
|   | { Mean  | 18            | 21            | 8                  | 16                  |
| Female  | { Range | 11-35         | 10-35         | 6-10               | 6-35                |
|   | { Mean  | 18            | 21            | 8                  | 16                  |
| 11. In the event of a radiological emergency at the Indian Point Nuclear Generating Station, who is in charge of operations at the Reception Center to be located in your building? |         |               |               |                    |                     |
|   |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Don't know  |         | 4             | 3             | 2                  | 9                   |
| Other   |         | 0             | 0             | 0                  | 0                   |



Table 3 (Cont'd)

12. Do you have any plans for your own students if you are notified that your school will be used as a Reception Center? (Asked only for Reception Centers located in schools.)

|           | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|-----------|---------------|---------------|--------------------|---------------------|
| Yes       | 3             | 2             | 2                  | 7                   |
| No        | 1             | 0             | 0                  | 1                   |
| No answer | 0             | 1             | 0                  | 1                   |

<sup>a</sup>Confidence interval = (0.62, 1.00), confidence level = 92%; confidence interval = (0.50, 1.00), confidence level = 100%.

<sup>b</sup>Confidence interval = (0.66, 1.00), confidence level = 80%; confidence interval = (0.50, 1.00), confidence level = 100%.

<sup>c</sup>Confidence interval = (0.10, 0.85), confidence level = 90%; confidence interval = (0.05, 0.75), confidence level = 100%.

<sup>d</sup>Confidence interval = (0.60, 0.96), confidence level = 90%; confidence interval = (0.17, 0.96), confidence level = 100%.

<sup>e</sup>Includes one school that has been closed and one school that has not accepted the responsibility of being a reception center.

<sup>f</sup>Includes only those facilities with showers.

#### Putnam County

Respondents at each of the three schools questioned in Putnam County were aware that their buildings had been designated as reception centers, but did not know who would notify them if it became necessary to activate their buildings as reception centers or who would be in charge of reception center operations. All of those schools responding had plans (e.g., dismissal of school) for their students if the buildings were to be used as a reception centers.

#### Westchester County

Five schools designated as reception centers in the CRRP were chosen for the sample in Westchester County. Of these schools, one was closed in 1979, and one refused to accept the responsibility of serving as a reception center. The respondent at the third school would not answer the questionnaire by telephone. Respondents at the two schools participating in the survey were aware that their buildings had been designated as reception centers. One of these knew who would notify the school if it became necessary to activate the building as a reception center. Neither knew who would be in charge of

reception center operations, but both schools had plans (e.g., dismissal of school) for the students if the buildings were to be used as reception centers.

### 2.3 CONGREGATE CARE CENTERS

Seventeen of the 119 facilities designated to serve as congregate care centers were sampled. Of those questioned,

- Eleven (65%) of the respondents were aware that their buildings were designated as congregate care centers,
- Ten (59%) of the respondents did not know who would notify them that their buildings were to be activated as congregate care centers, and
- Nine (56%) of the schools had plans for their students if the buildings were to be used as congregate care centers.

Table 4 lists the questions and numerical results of the congregate care center survey.

#### Orange County

Four schools designated to serve as congregate care centers in Orange County were included in the sample. Each of these schools responded to the survey. Respondents at three of the schools were aware of their inclusion in the CNERP, but each respondent had a different idea as to who would notify the school if it became necessary to activate the building as a congregate care center. All of the schools had plans for their students if the buildings were activated as congregate care centers.

#### Putnam County

In Putnam County, five facilities were sampled. Respondents at two were aware that their buildings had been designated as congregate care centers. Four did not know who would notify them if it became necessary to activate their buildings as congregate care centers. Two of the schools (there was one hospital in the sample) had plans for their students if it became necessary to activate the buildings as congregate care centers.

Table 4 Results of the Survey of Congregate Care Centers

| 1. Are you aware that your building is designated as a congregate care center?                               |                |                |                    |                     |
|--|----------------|----------------|--------------------|---------------------|
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 3 <sup>a</sup> | 2 <sup>b</sup> | 6 <sup>c</sup>     | 11 <sup>d</sup>     |
| No   | 0              | 3              | 2                  | 5                   |
| Don't know   | 1              | 0              | 0                  | 1                   |
| 2. Who would notify you that your building is to be activated as a congregate care center?                   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Civil defense  | 1              | 1              | 1                  | 3                   |
| Health department  | 0              | 0              | 1                  | 1                   |
| Red Cross  | 1              | 0              | 0                  | 1                   |
| Superintendent of schools  | 1              | 0              | 0                  | 1                   |
| Other  | 0              | 0              | 1                  | 1                   |
| Don't know   | 1              | 4              | 5                  | 10                  |
| 3. How would you be notified that your building is to be activated as a congregate care center? <sup>e</sup> |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Telephone  | 3              | 1              | 4                  | 8                   |
| Radio  | 1              | 0              | 0                  | 1                   |
| In person  | 1              | 0              | 0                  | 1                   |
| Don't know   | 1              | 4              | 4                  | 9                   |
| 4. Is your building utilized 12 months a year?   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 4              | 4              | 6                  | 14                  |
| No   | 0              | 1              | 1                  | 2                   |
| No answer  | 0              | 0              | 1                  | 1                   |

Table 4 (Cont'd)

| 5. Who is authorized to open the building after working hours (and weekends, vacations, summers if applicable) in case it is needed as a congregate care center during a radiological emergency? <sup>e</sup> |               |               |                    |                     |
|---|---------------|---------------|--------------------|---------------------|
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Superintendent  | 0             | 0             | 5                  | 5                   |
| Principal   | 3             | 1             | 4                  | 8                   |
| Custodian   | 3             | 3             | 3                  | 9                   |
| Secretary   | 1             | 0             | 1                  | 2                   |
| Board of Education  | 1             | 1             | 3                  | 5                   |
| Teacher   | 0             | 1             | 0                  | 1                   |
| Don't know  | 0             | 0             | 1                  | 1                   |
| Not applicable (open 24 hr/day)   | 0             | 1             | 0                  | 1                   |
| 6. Is there a backup person in case the regular person isn't available?   |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 4             | 4             | 7                  | 15                  |
| No  | 0             | 0             | 0                  | 0                   |
| Don't know  | 0             | 0             | 1                  | 1                   |
| 7. What is the normal occupancy of your building?   |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 425-1800      | 100-1600      | 300-2300           | 100-2300            |
| Mean  | 1062          | 621           | 966                | 887                 |
| 8. What is the capacity of your parking lots? (automobiles)   |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 250-unlimited | 40-500        | 40-600             | 40-unlimited        |
| Mean  | ---           | 142           | ---                | ---                 |
| 9. Are there showers in the your building?  |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 3             | 3             | 5                  | 11                  |
| No  | 1             | 2             | 3                  | 6                   |

Table 4 (Cont'd)

| 9a. How many showers are there in the building? <sup>f</sup>  |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|---|---------|---------------|---------------|--------------------|---------------------|
| Male  | { Range | 10-29         | 3-10          | 2-12               | 2-29                |
|   | { Mean  | 18            | 7             | 9                  | 11                  |
| Female  | { Range | 12-33         | 3-10          | 0-12               | 0-33                |
|   | { Mean  | 20            | 7             | 8                  | 11                  |
| 10. Approximately how many toilets are there in the building? <sup>f</sup>  |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Male  | { Range | 10-30         | 8-30          | 8-20               | 8-30                |
|   | { Mean  | 18            | 16            | ---                | ---                 |
| Female  | { Range | 10-33         | 8-30          | 8-20               | 8-33                |
|   | { Mean  | 23            | 16            | ---                | ---                 |
| 11. In the event of a radiological emergency at the Indian Point Nuclear Generating Station, who is in charge of operations at the congregate care center?                                  |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Civil defense   |         | 0             | 0             | 1                  | 1                   |
| Red Cross   |         | 0             | 0             | 1                  | 1                   |
| Other   |         | 1             | 1             | 1                  | 3                   |
| Don't know  |         | 3             | 4             | 5                  | 12                  |
| 12. Do you have any plans for your own students if you are notified that your school will be used as a congregate care center? (Asked only for congregate care centers located in schools.) |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes   |         | 4             | 2             | 3                  | 9                   |
| No  |         | 0             | 2             | 5                  | 7                   |
| Not applicable  |         | 0             | 1             | 0                  | 1                   |

<sup>a</sup>Confidence interval = (0.33, 0.92), confidence level = 93%; confidence interval = (0.25, 0.92), confidence level = 100%.

<sup>b</sup>Confidence interval = (0.07, 0.77), confidence level = 90%; confidence interval = (0.07, 0.90), confidence level = 100%.

<sup>c</sup>Confidence interval = (0.47, 0.97), confidence level = 90%; confidence interval = (0.08, 0.97), confidence level = 100%.

<sup>d</sup>Confidence interval = (0.47, 0.95), confidence level = 90%; confidence interval = (0.09, 0.95), confidence level = 100%.

<sup>e</sup>Multiple responses were given by some facilities.

<sup>f</sup>Number of unspecified facilities is divided equally between male and female.

### Westchester County

Of the eight schools sampled in Westchester County, respondents at six were aware that their buildings were designated as congregate care centers in the CRERP. Five respondents did not know who would notify them if it became necessary to activate their buildings as congregate care centers. Three of the schools had plans for students if their buildings were to be activated as congregate care centers.

#### 2.4 PUBLIC SCHOOLS WITHIN THE EPZ

Of the 50 public schools within the EPZ, ten were chosen for the sample and nine responded to the survey. Of these nine schools,

- Eight (89%) had been contacted regarding the CRERP,
- Two (22%) had personnel with some training in evacuation procedures,
- Two (22%) had such training scheduled, and
- Six (67%) had tone alert radios.

Table 5 lists the questions and numerical results of the public school survey.

### Orange County

Three Orange County public schools within the EPZ were chosen in a random sample of all such schools in the county. Two of these three schools had been contacted regarding their roles in the CRERP, two had staff trained in procedures for evacuating the schools, and two had tone alert radios.

### Putnam County

In Putnam County, two public schools within the EPZ were included in the survey. Both of the schools had been contacted regarding their roles in the CRERP. Neither of the schools had staff trained in procedures for evacuating the schools. One school had a tone alert ratio.

### Westchester County

Five Westchester County public schools within the EPZ were questioned in the survey. Respondents at four of these schools were willing to answer questions on the telephone. The respondent at the other public school preferred to submit written responses to the questions and consequently this school is not included in the findings discussed here. Each of the remaining four schools had been contacted regarding its role in the CRERP. None of the schools had staff trained in procedures for evacuating the schools. Three schools had tone alert radios.

Table 5 Results of the Survey of Public Schools within the EPZ

| 1. How many students attend your school?  |                |                |                    |                     |
|---|----------------|----------------|--------------------|---------------------|
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 250-650        | 262-775        | 420-2000           | 250-2000            |
| Mean  | 387            | 519            | 1023               | 699                 |
| 3. Have you or someone in your school been contacted to discuss your role in the Indian Point Radiological Emergency Response plan? |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 2 <sup>a</sup> | 2 <sup>b</sup> | 4 <sup>c</sup>     | 8 <sup>d</sup>      |
| No  | 1              | 0              | 0                  | 1                   |
| 3a. If yes, who contacted your school? <sup>e</sup>   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| County  | 0              | 0              | 1                  | 1                   |
| State   | 0              | 0              | 1                  | 1                   |
| Board of Education  | 1              | 0              | 1                  | 2                   |
| Civil defense   | 0              | 1              | 0                  | 1                   |
| Don't know  | 0              | 1              | 2                  | 3                   |
| Other   | 1              | 0              | 0                  | 1                   |
| 3b. If yes, when was your school contacted?   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| 1983  | 0              | 0              | 1                  | 1                   |
| 1982  | 2              | 0              | 1                  | 3                   |
| Don't know  | 0              | 2              | 2                  | 4                   |
| 4. Have you or any of your staff received any training in procedures for evacuating your school?                                    |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 2 <sup>a</sup> | 0 <sup>f</sup> | 0 <sup>g</sup>     | 2 <sup>h</sup>      |
| No  | 1              | 2              | 4                  | 7                   |
| 5. Are any training sessions planned?   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 2              | 0              | 0                  | 2                   |
| No  | 1              | 2              | 3                  | 6                   |
| Don't know  | 0              | 0              | 1                  | 1                   |

Table 5 (Cont'd)

| 6. Who will contact you to tell you that your school is to be evacuated?   |                |                |                    |                     |
|--|----------------|----------------|--------------------|---------------------|
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| District office  | 0              | 0              | 3                  | 3                   |
| Civil defense  | 1              | 1              | 0                  | 2                   |
| County   | 1              | 0              | 0                  | 1                   |
| Don't know   | 1              | 1              | 1                  | 3                   |
| 7. How will you be contacted? <sup>e</sup>   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Telephone  | 2              | 2              | 2                  | 6                   |
| Radio  | 1              | 0              | 2                  | 3                   |
| In person  | 0              | 0              | 1                  | 1                   |
| Don't know   | 1              | 0              | 0                  | 1                   |
| 8. Do you have a tone alert radio in your school?  |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2 <sup>a</sup> | 1 <sup>i</sup> | 3 <sup>j</sup>     | 6 <sup>k</sup>      |
| No   | 1              | 1              | 1                  | 3                   |
| 9. Are you responsible for contacting any other schools or facilities in your area to inform them that they are to be evacuated? |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 1              | 0              | 0                  | 1                   |
| No   | 2              | 1              | 3                  | 6                   |
| Don't know   | 0              | 1              | 1                  | 2                   |
| 10. Have you been informed who will provide buses if evacuation becomes necessary?   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Westpoint Tours  | 2              | 0              | 0                  | 2                   |
| School district  | 1              | 1              | 0                  | 2                   |
| Vanguard   | 0              | 0              | 2                  | 2                   |
| Other  | 0              | 0              | 1                  | 1                   |
| Don't know   | 0              | 1              | 1                  | 2                   |



Table 5 (Cont'd)

|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|---|---------------|---------------|--------------------|---------------------|
| 11. Have you been informed where your students will be taken initially if your school is evacuated? |               |               |                    |                     |
| Yes   | 2             | 2             | 4                  | 8                   |
| No  | 1             | 0             | 0                  | 1                   |

<sup>a</sup>Confidence interval = (0.40, 0.80), confidence level = 100%.

<sup>b</sup>Confidence interval = (0.50, 1.00), confidence level = 100%.

<sup>c</sup>Confidence interval = (0.59, 1.00), confidence level = 90%; confidence interval = (0.10, 1.00), confidence level = 100%.

<sup>d</sup>Confidence interval = (0.66, 0.98), confidence level = 90%; confidence interval = (0.16, 0.98), confidence level = 100%.

<sup>e</sup>Multiple responses were given by some facilities.

<sup>f</sup>Confidence interval = (0.00, 0.50), confidence level = 100%.

<sup>g</sup>Confidence interval = (0.00, 0.41), confidence level = 90%; confidence interval = (0.00, 0.90), confidence level = 100%.

<sup>h</sup>Confidence interval = (0.04, 0.46), confidence level = 89%; confidence interval = (0.04, 0.86), confidence level = 100%.

<sup>i</sup>Confidence interval = (0.25, 0.75), confidence level = 100%.

<sup>j</sup>Confidence interval = (0.34, 0.98), confidence level = 89%; confidence interval = (0.07, 0.98), confidence level = 100%.

<sup>k</sup>Confidence interval = (0.36, 0.88), confidence level = 90%; confidence interval = (0.12, 0.94), confidence level = 100%.

## 2.5 NONPUBLIC SCHOOLS, NURSERY SCHOOLS, AND DAY CARE CENTERS WITHIN THE EPZ

Nine of the 41 nonpublic schools, nursery schools, and day care centers within the EPZ were sampled. Of the nine schools surveyed,

- Eight (89%) had been contacted regarding the CRERP,
- Two (22%) had personnel with some training in evacuation procedures,

- None had training sessions planned, and
- Seven (78%) had tone alert radios.

Table 6 lists the questions and numerical results of this survey.

#### Orange County

Two Orange County nonpublic schools, nursery schools, or day care centers within the EPZ were included in the sample. One of the two schools had been contacted regarding its role in the CRERP. The staff of one school had received some training in procedures for evacuating the school. One facility had a tone alert radio, and the respondent at this facility expected to be contacted by radio in an emergency. The other facility had not received a tone alert radio, and the respondent there expected to be contacted by telephone.

#### Putnam County

In Putnam County, two nonpublic schools, nursery schools, or day care centers within the EPZ were included in the sample. Each of the schools had been contacted regarding its role in the CRERP. The staff of one school had received some training in procedures for evacuating the school. One of the schools had a tone alert radio and the respondent expected to be contacted by radio in an emergency. The other school did not have a tone alert radio, and the respondent there expected to be contacted by telephone.

#### Westchester County

Five Westchester County nonpublic schools, nursery schools, or day care centers within the EPZ were included in the sample. Each of the five schools had been contacted regarding its role in the CRERP. The staff of one of the five schools had received some training in procedures for evacuating the school. All five schools had tone alert radios in the buildings, and all respondents expected to be contacted by radio in an emergency.

### 2.6 SCHOOL DISTRICTS WITHIN THE EPZ

Eight of the school districts with schools within the EPZ were sampled. Of the eight districts surveyed;

- Seven (88%) had been contacted by the state or county,
- Two (25%) had personnel with some training in evacuation procedures,

Table 6 Results of the Survey of Nonpublic Schools, Nursery Schools, and Day Care Centers within the EPZ

| 1. How many students attend your school?  |                |                |                    |                     |
|---|----------------|----------------|--------------------|---------------------|
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Range   | 17-129         | 40-100         | 62-425             | 17-425              |
| Mean  | 73             | 70             | 217                | 152                 |
| 3. Have you or someone in your school been contacted to discuss your role in the Indian Point Radiological Emergency Response Plan? |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 1 <sup>a</sup> | 2 <sup>b</sup> | 5 <sup>c</sup>     | 8 <sup>d</sup>      |
| No  | 0              | 0              | 0                  | 0                   |
| Don't know  | 1              | 0              | 0                  | 1                   |
| 3a. If yes, who contacted your school?  |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Utility   | 0              | 0              | 1                  | 1                   |
| Don't know  | 1              | 2              | 4                  | 7                   |
| 3b. If yes, when was your school contacted?   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| 1982  | 0              | 0              | 3                  | 3                   |
| 1983  | 0              | 0              | 2                  | 2                   |
| Don't know  | 1              | 2              | 0                  | 3                   |
| 4. Have you or any of your staff received any training in procedures for evacuating your school?                                    |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 1 <sup>a</sup> | 0 <sup>e</sup> | 1 <sup>f</sup>     | 2 <sup>g</sup>      |
| No  | 0              | 1              | 4                  | 5                   |
| Don't know  | 1              | 1              | 0                  | 2                   |
| 5. Are any training sessions planned?   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 0              | 0              | 0                  | 0                   |
| No  | 1              | 1              | 5                  | 7                   |
| Don't know  | 1              | 1              | 0                  | 2                   |

Table 6 (Cont'd)

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| 6. Who will contact you to tell you that your school is to be evacuated? | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|--|---------------|---------------|--------------------|---------------------|
| Civil defense  | 0             | 1             | 0                  | 1                   |
| Police   | 1             | 0             | 0                  | 1                   |
| Other school   | 1             | 0             | 0                  | 1                   |
| Radio  | 0             | 0             | 5                  | 5                   |
| Don't know   | 0             | 1             | 0                  | 1                   |

| 7. How will you be contacted? <sup>h</sup> | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|--|---------------|---------------|--------------------|---------------------|
| Telephone                                  | 1             | 1             | 0                  | 2                   |
| Radio                                      | 1             | 1             | 5                  | 7                   |

| 8. Do you have a tone alert radio in your school? | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
|---|----------------|----------------|--------------------|---------------------|
| Yes   | 1 <sup>a</sup> | 1 <sup>a</sup> | 5 <sup>c</sup>     | 7 <sup>m</sup>      |
| No  | 1              | 1              | 0                  | 2                   |

| 9. Are you responsible for contacting any other schools or facilities in your area to inform them that they are to be evacuated? | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|--|---------------|---------------|--------------------|---------------------|
| Yes  | 0             | 0             | 1                  | 1                   |
| No   | 2             | 2             | 4                  | 8                   |

| 10. Have you been informed who will provide buses if evacuation becomes necessary? <sup>h</sup> | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|---|---------------|---------------|--------------------|---------------------|
| West Point Tours  | 1             | 0             | 3                  | 4                   |
| Vanguard  | 0             | 0             | 0                  | 0                   |
| Omnivan   | 0             | 0             | 1                  | 1                   |
| Don't know  | 1             | 2             | 2                  | 5                   |

| 11. Have you been informed where your students will be taken initially if your school is evacuated? | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|---|---------------|---------------|--------------------|---------------------|
| Yes   | 2             | 2             | 4                  | 8                   |
| No  | 0             | 0             | 1                  | 1                   |

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- <sup>a</sup>Confidence interval = 0.50, confidence level = 100%.
- <sup>b</sup>Confidence interval = 1.00, confidence level = 100%.
- <sup>c</sup>Confidence interval = (0.64,1.00) confidence level = 91%; confidence interval = (0.14,1.00) confidence level = 100%.
- <sup>d</sup>Confidence interval = (0.66,0.98), confidence level = 90%; confidence interval = (0.20,0.98), confidence level = 100%.
- <sup>e</sup>Confidence interval = 0.00, confidence level = 100%.
- <sup>f</sup>Confidence interval = (0.03,0.56), confidence level = 89%; confidence interval = (0.03,0.89), confidence level = 100%.
- <sup>g</sup>Confidence interval = (0.05,0.46), confidence level = 90%; confidence interval = (0.05,0.83), confidence level = 100%.
- <sup>h</sup>Multiple responses were given by some facilities.
- <sup>i</sup>Confidence interval = (0.54,0.95), confidence level = 90%; confidence interval = (0.17,0.95), confidence level = 100%.

- Two (25%) had such training scheduled, and
- Six (75%) had an official who knew who would contact the district if schools needed to be evacuated.

Table 7 lists the questions and numerical results of the school district survey.

#### Orange County

Both Orange County school districts within the EPZ were included in the sample. One district had been contacted by the state or county. The staff of one of the school districts had received some training in procedures for evacuating its schools. Neither district had a tone alert radio in the district office.

#### Putnam County

In Putnam County, two school districts within the EPZ were surveyed. Both districts had been contacted by the state or county. The staffs of the two school districts had not received any training in procedures for evacuating their schools. One of the districts had a tone alert radio in the district office.

#### Westchester County

Four Westchester County school districts within the EPZ were included in the survey. Each of the school districts in the sample had been contacted by the state or county. The staff of one district had received some training in procedures for evacuating its schools. Two of the sampled districts had tone alert radios in the district offices.

Table 7 Results of the Survey of School Districts within the EPZ

1. How many schools are in this district which are within the plume exposure emergency planning zone?

|               | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|---------------|---------------|---------------|--------------------|---------------------|
| One school    | 1             | 1             | 1                  | 3                   |
| Two schools   | 0             | 1             | 0                  | 1                   |
| Three schools | 1             | 0             | 1                  | 2                   |
| Five schools  | 0             | 0             | 1                  | 1                   |
| Ten schools   | 0             | 0             | 1                  | 1                   |

2. Have you or someone on your staff been contacted by the state or county to discuss your role in Indian Point Radiological Emergency Response Plan?

|     | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
|-----|----------------|----------------|--------------------|---------------------|
| Yes | 1 <sup>a</sup> | 2 <sup>b</sup> | 4 <sup>c</sup>     | 7 <sup>d</sup>      |
| No  | 1              | 0              | 0                  | 1                   |

- 2a. If yes, who contacted you concerning the plan?

|               | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|---------------|---------------|---------------|--------------------|---------------------|
| County        | 1             | 0             | 1                  | 2                   |
| Civil defense | 0             | 2             | 0                  | 2                   |
| Utility       | 0             | 0             | 1                  | 1                   |
| Other         | 0             | 0             | 2                  | 2                   |
| Don't know    | 0             | 0             | 1                  | 1                   |

- 2b. If yes, when were you contacted concerning the plan?

|      | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|------|---------------|---------------|--------------------|---------------------|
| 1983 | 0             | 0             | 3                  | 3                   |
| 1982 | 1             | 2             | 1                  | 4                   |

3. Have you or any of your staff received any training in procedures for evacuating the schools in your district?

|     | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
|-----|----------------|----------------|--------------------|---------------------|
| Yes | 1 <sup>a</sup> | 0 <sup>e</sup> | 1 <sup>f</sup>     | 2 <sup>g</sup>      |
| No  | 1              | 2              | 3                  | 6                   |

4. Are any training sessions planned?

|            | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|------------|---------------|---------------|--------------------|---------------------|
| Yes        | 1             | 0             | 1                  | 2                   |
| No         | 0             | 1             | 3                  | 4                   |
| Don't know | 1             | 1             | 0                  | 2                   |

Table 7 (Cont'd)

| 5. Who will contact you to tell you that some or all of the schools in your district are to be evacuated? |               |               |                    |                     |
|---|---------------|---------------|--------------------|---------------------|
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Superintendent of Hendrick Hudson School District   | 0             | 1             | 2                  | 3                   |
| Civil defense   | 0             | 1             | 0                  | 1                   |
| Other   | 1             | 0             | 1                  | 2                   |
| Don't know  | 1             | 0             | 1                  | 2                   |

| 6. How will you be contacted? <sup>h</sup> |               |               |                    |                     |
|--|---------------|---------------|--------------------|---------------------|
|  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Telephone                                  | 1             | 2             | 4                  | 7                   |
| Radio                                      | 0             | 1             | 0                  | 1                   |
| Don't know                                 | 1             | 0             | 0                  | 1                   |

| 7. Is there a tone alert radio in the district offices? |               |               |                    |                     |
|---|---------------|---------------|--------------------|---------------------|
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 0             | 1             | 2                  | 3                   |
| No  | 2             | 1             | 2                  | 5                   |

| 8. Are you responsible for contacting any other schools or facilities in your area to inform them that they are to be evacuated? |               |               |                    |                     |
|--|---------------|---------------|--------------------|---------------------|
|  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 1             | 0             | 3                  | 4                   |
| No   | 1             | 2             | 0                  | 3                   |
| Don't know   | 0             | 0             | 1                  | 1                   |

<sup>a</sup>Confidence interval = 0.50, confidence level = 100%.

<sup>b</sup>Confidence interval = (0.67,1.00), confidence level = 100%.

<sup>c</sup>Confidence interval = (0.62,1.00), confidence level = 92%; confidence interval = (0.5,1.00), confidence level = 100%.

<sup>d</sup>Confidence interval = (0.69,0.92), confidence level = 88%; confidence interval = (0.54,0.92), confidence level = 100%.

<sup>e</sup>Confidence interval = (0.00,0.33), confidence level = 100%.

<sup>f</sup>Confidence interval = (0.125,0.625), confidence level = 100%.

<sup>g</sup>Confidence interval = (0.15,0.46), confidence level = 91%; confidence interval = (0.15,0.54), confidence level = 100%.

<sup>h</sup>Multiple responses were given by some facilities.

## 2.7 HOSPITALS AND NURSING HOMES WITHIN THE EPZ

Seven of the 23 hospitals and nursing homes within the EPZ were surveyed. Of the facilities surveyed;

- Six (86%) had been contacted by the state or county,
- Three (43%) had personnel with some training in evacuation procedures, and
- All (100%) had tone alert radios.

Respondents at three (43%) said that they did not know where residents would be taken if it became necessary to evacuate the facilities. Table 8 lists the questions and numerical results of the hospital and nursing home survey.

### Orange County

One hospital and no nursing homes in Orange County are within the EPZ, so the survey is based on a 100% sample. The hospital had not been contacted by the state or county concerning the CRERP, had no personnel trained in evacuation procedures, and had no evacuation training sessions planned. The respondent did not know who would contact the hospital if an evacuation were necessary or where residents would be taken during an evacuation. The hospital did have a tone alert radio and sufficient vehicles to execute an evacuation.

### Putnam County

In Putnam County, one hospital and one nursing home are within the EPZ, and each was surveyed. Both facilities had been contacted by the state or county concerning the CRERP. Neither facility had personnel trained in evacuation procedures, but training sessions were planned for one. One respondent knew who would contact the facility if an evacuation were necessary, and both facilities had tone alert radios. Neither respondent knew how many additional vehicles were needed for an evacuation. One respondent knew where its residents would be taken during an evacuation.

### Westchester County

Four of the 20 hospitals and nursing homes in Westchester County within the EPZ were surveyed. All of these facilities had been contacted by the state or county concerning the CRERP, and the staff of three facilities had received some training in procedures for evacuating the residents of their facilities. Three facilities reported that additional training sessions were planned. One respondent knew who would contact the facility if an evacuation were necessary. Each facility had a tone alert radio. All of the respondents indicated that additional vehicles were needed for an evacuation and three knew where residents would be taken during an evacuation.



Table 8 Results of the Survey of Hospitals and Nursing Homes to be Evacuated

| 1. How many patients and residents do you have, on average?  |                |                |                    |                     |
|--|----------------|----------------|--------------------|---------------------|
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westclester</u> | <u>All Counties</u> |
| Range  | 80             | 15-36          | 56-190             | 15-190              |
| Mean   | 80             | 26             | 96                 | 74                  |
| 2a. On average, how many are ambulatory?   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Range  | 75             | 14-20          | 8-150              | 8-150               |
| Mean   | 75             | 17             | 65                 | 53                  |
| 2b. On average, how many require a wheelchair?   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Range  | 5              | 1-8            | 0-78               | 0-78                |
| Mean   | 5              | 5              | 27                 | 18                  |
| 2c. On average, how many require a stretcher?  |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Range  | 0              | 0-8            | 0-14               | 0-14                |
| Mean   | 0              | 4              | 4                  | 3                   |
| 3. Have you been contacted by the state or county to discuss your role in the Indian Point Radiological Emergency Response Plan? |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 0 <sup>a</sup> | 2 <sup>b</sup> | 4 <sup>c</sup>     | 6 <sup>d</sup>      |
| No   | 1              | 0              | 0                  | 1                   |
| 3a. If yes, who contacted you? <sup>e</sup>  |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Health department  | ---            | 0              | 1                  | 1                   |
| Civil defense  | ---            | 1              | 0                  | 1                   |
| County   | ---            | 0              | 2                  | 2                   |
| Utility  | ---            | 0              | 1                  | 1                   |
| Don't know   | ---            | 1              | 1                  | 2                   |

Table 8 (Cont'd)

| 3b. If yes, when were you contacted?   |                |                |                    |                     |
|--|----------------|----------------|--------------------|---------------------|
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| 1982   | ---            | 2              | 1                  | 3                   |
| Several times  | ---            | 0              | 2                  | 2                   |
| Don't know   | ---            | 0              | 1                  | 1                   |
| 4. Have you or your staff received any training in procedures for evacuating the residents in your facility? |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 0 <sup>a</sup> | 0 <sup>b</sup> | 3 <sup>f</sup>     | 3 <sup>g</sup>      |
| No   | 1              | 2              | 1                  | 4                   |
| 5. Are training sessions planned?  |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 0              | 1              | 3                  | 4                   |
| No   | 1              | 1              | 1                  | 3                   |
| 6. Who will contact you to tell you that your facility is to be evacuated?                                   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Sheriff  | 0              | 1              | 1                  | 2                   |
| Other  | 0              | 0              | 0                  | 0                   |
| Don't know   | 1              | 1              | 3                  | 5                   |
| 7. How will you be contacted? <sup>e</sup>   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Telephone  | 0              | 2              | 1                  | 3                   |
| Radio  | 1              | 1              | 3                  | 5                   |
| 8. Is there a tone alert radio in your facility?   |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 1              | 2              | 4                  | 7                   |
| No   | 0              | 0              | 0                  | 0                   |

Table 8 (Cont'd)

9. How many facility-owned vehicles do you have available for evacuation of your residents?

|            |         | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|------------|---------|---------------|---------------|--------------------|---------------------|
| Buses      | { Range | ---           | 0             | 0                  | 0                   |
|            | { Mean  | ---           | 0             | 0                  | ---                 |
| Vans       | { Range | ---           | 0-1           | 1-2                | 0-2                 |
|            | { Mean  | ---           | 1             | 1                  | ---                 |
| Ambulances | { Range | ---           | 0-3           | 0                  | 0-3                 |
|            | { Mean  | ---           | 2             | 0                  | ---                 |
| Other      | { Range | 5             | 0-1           | 0-1                | 0-5                 |
|            | { Mean  | 5             | 1             | 0                  | 1                   |

10. If this number is inadequate, how many additional vehicles would be needed?

|            | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|------------|---------------|---------------|--------------------|---------------------|
| 2 buses    | 0             | 0             | 1                  | 1                   |
| 3 buses    | 0             | 0             | 1                  | 1                   |
| Don't know | 0             | 2             | 2                  | 4                   |
| None       | 1             | 0             | 0                  | 1                   |

11. What facility will act as the reception center for your residents?

|              | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|--------------|---------------|---------------|--------------------|---------------------|
| White Plains | 0             | 0             | 2                  | 2                   |
| Beacon       | 0             | 1             | 0                  | 1                   |
| Cannon       | 0             | 0             | 1                  | 1                   |
| Don't know   | 1             | 1             | 1                  | 3                   |

<sup>a</sup>Confidence interval = 0.00, confidence level = 100%.

<sup>b</sup>Confidence interval = 1.00, confidence level = 100%.

<sup>c</sup>Confidence interval = (0.60,1.00), confidence level = 90%; confidence interval = (0.20,1.00), confidence level = 100%.

<sup>d</sup>Confidence interval = (0.57,0.96), confidence level = 92%; confidence interval = (0.26,0.96), confidence level = 100%.

<sup>e</sup>Multiple responses were given by some facilities.

<sup>f</sup>Confidence interval = (0.35,0.95), confidence level = 90%; confidence interval = (0.15,0.95), confidence level = 100%.

<sup>g</sup>Confidence interval = (0.13,0.70), confidence level = 91%; confidence interval = (0.13,0.83), confidence level = 100%.

## 2.8 HOSPITALS CAPABLE OF TREATING RADIOLOGICALLY CONTAMINATED PATIENTS

Each of the six hospitals listed in the CRERP as being capable of treating radiologically contaminated patients was surveyed. Of the hospitals listed in the CRERP,

- Five (83%) had respondents who were aware that their hospitals may be used for the emergency treatment of patients if there is an emergency at the Indian Point Nuclear Power Station,
- Four (67%) had staffs trained for radiological emergencies, and
- All (100%) had standard operating procedures for treating contaminated patients.

Table 9 lists the questions and numerical results of this survey.

### Orange County

Two hospitals are listed in the Orange County CRERP as being capable of treating radiologically contaminated patients, and both were included in the sample. Respondents at both hospitals were aware that their facilities may be used for the emergency treatment of radioactively contaminated patients if there is an emergency at Indian Point, and both had been contacted by the state or county. One respondent knew who would notify the hospital to prepare for contaminated patients. The staff of each hospital was trained for radiological emergencies, and each hospital had standard operating procedures for treating contaminated patients.

### Putnam County

The one hospital in Putnam County that is listed in the CRERP was surveyed. Although the hospital had been contacted by the county, the survey respondent was not aware that the facility may be used for the emergency treatment of radioactively contaminated patients if there is an emergency at Indian Point. The respondent also did not know who would notify the hospital to prepare for such patients. The hospital staff has not been trained for radiological emergencies, but there were standard operating procedures for treating contaminated patients.

### Westchester County

Westchester County has three hospitals listed in the CRERP to treat radioactively contaminated patients and each facility was surveyed. All of the respondents were aware that their hospitals may be used for the emergency treatment of patients if there is an emergency at Indian Point, and two had been contacted by the state or county. Each responded differently when asked

Table 9 Results of the Survey of Hospitals Capable of Treating Radiologically Contaminated Patients<sup>a</sup>

1. Do you know that this hospital may be used for the emergency treatment of patients if there is an emergency at the Indian Point Nuclear Power Station?

|     | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|-----|---------------|---------------|--------------------|---------------------|
| Yes | 2             | 0             | 3                  | 5                   |
| No  | 0             | 1             | 0                  | 1                   |

2. Who would notify you that your hospital should prepare for potentially contaminated injured patients?

|                   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|-------------------|---------------|---------------|--------------------|---------------------|
| County            | 0             | 0             | 1                  | 1                   |
| County sheriff    | 1             | 0             | 0                  | 1                   |
| Police department | 0             | 0             | 1                  | 1                   |
| Don't know        | 1             | 1             | 1                  | 3                   |

3. How would you be notified?<sup>b</sup>

|            | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|------------|---------------|---------------|--------------------|---------------------|
| Telephone  | 0             | 0             | 2                  | 2                   |
| Radio      | 1             | 0             | 1                  | 2                   |
| Other      | 0             | 0             | 1                  | 1                   |
| Don't know | 1             | 1             | 0                  | 2                   |

4. Have you been contacted by the state or county to discuss your role in responding to an emergency at the Indian Point Nuclear Power Station?

|            | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|------------|---------------|---------------|--------------------|---------------------|
| Yes        | 2             | 1             | 2                  | 5                   |
| No         | 0             | 0             | 0                  | 0                   |
| Don't know | 0             | 0             | 1                  | 1                   |

- 4a. If yes, who contacted you?

|                             | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|-----------------------------|---------------|---------------|--------------------|---------------------|
| County                      | 1             | 0             | 1                  | 2                   |
| Office of Natural Disasters | 1             | 0             | 0                  | 1                   |
| Other                       | 0             | 0             | 1                  | 1                   |
| Don't know                  | 0             | 1             | 0                  | 1                   |

Table 9 (Cont'd)

4b. If yes, when were you contacted?

|                 | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|-----------------|---------------|---------------|--------------------|---------------------|
| Dec. 1982       | 0             | 0             | 1                  | 1                   |
| Over a year ago | 1             | 1             | 0                  | 2                   |
| Don't know      | 1             | 0             | 1                  | 2                   |

5. Is the staff of this facility trained for radiological emergencies that may take place at a nuclear power station?

|     | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|-----|---------------|---------------|--------------------|---------------------|
| Yes | 2             | 0             | 2                  | 4                   |
| No  | 0             | 1             | 1                  | 2                   |

5a. Are the following personnel on the staff at the facility?

|  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|--|---------------|---------------|--------------------|---------------------|
| Health Physicist                                 | 2             | 0             | 3                  | 5                   |
| Health Physics Technician                        | 0             | 0             | 2                  | 2                   |
| X-ray Technician with<br>health physics training | 0             | 0             | 3                  | 3                   |

6. Are dosimeters provided for personnel who will be caring for contaminated injured persons?

|            | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|------------|---------------|---------------|--------------------|---------------------|
| Yes        | 1             | 1             | 3                  | 5                   |
| No         | 0             | 0             | 0                  | 0                   |
| Don't know | 1             | 0             | 0                  | 1                   |

6a. If yes, what type of dosimeters are used?

|                     | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
|---------------------|---------------|---------------|--------------------|---------------------|
| Pocket self reading | 0             | 0             | 2                  | 2                   |
| Film badge          | 1             | 1             | 3                  | 5                   |
| Thermoluminescent   | 0             | 0             | 0                  | 0                   |

Table 9 (Cont'd)

| 7. Are there survey instruments available?   |               |               |                    |                     |
|--|---------------|---------------|--------------------|---------------------|
|  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2             | 0             | 2                  | 4                   |
| No   | 0             | 1             | 0                  | 1                   |
| Don't know   | 0             | 0             | 1                  | 1                   |
| 7a. If yes, what type of survey instruments are available?   |               |               |                    |                     |
|  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Geiger counters  | 2             | 0             | 2                  | 4                   |
| 8. Can an area be set aside for the treatment of radioactively contaminated patients that is separate from normal hospital operations? |               |               |                    |                     |
|  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2             | 0             | 3                  | 5                   |
| No   | 0             | 0             | 0                  | 0                   |
| Don't know   | 0             | 1             | 0                  | 1                   |
| 9. Are there sinks, showers, and change areas?   |               |               |                    |                     |
|  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2             | 0             | 2                  | 4                   |
| No   | 0             | 0             | 1                  | 1                   |
| No answer  | 0             | 1             | 0                  | 1                   |
| 10a. Are there facilities for solid waste containment and/or disposal?   |               |               |                    |                     |
|  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2             | 0             | 3                  | 5                   |
| No   | 0             | 1             | 0                  | 1                   |
| 10b. Are there facilities for liquid waste containment and/or disposal?  |               |               |                    |                     |
|  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2             | 0             | 3                  | 5                   |
| No   | 0             | 1             | 0                  | 1                   |

Table 9 (Cont'd)

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|  |               |               |                    |                     |
|--|---------------|---------------|--------------------|---------------------|
| 10c. Can facilities for waste containment and/or disposal be disposed?   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 1             | 0             | 2                  | 3                   |
| No   | 0             | 1             | 0                  | 1                   |
| Don't know   | 1             | 0             | 1                  | 2                   |
|  |               |               |                    |                     |
| 11. Are communications available to communicate with fixed and mobile facilities?  | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2             | 1             | 2                  | 5                   |
| No   | 0             | 0             | 1                  | 1                   |
|  |               |               |                    |                     |
| 11a. If yes, what communications systems are used?   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Radio  | 2             | 1             | 2                  | 5                   |
|  |               |               |                    |                     |
| 12. Are there standard operating procedures for hospital personnel treating patients who have radioactively contaminated wounds, gross contamination, or gross gamma whole body exposures? | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2             | 1             | 3                  | 6                   |
| No   | 0             | 0             | 0                  | 0                   |

---

<sup>a</sup>Since all of the hospitals listed in the plans as being capable of treating radiologically contaminated patients were surveyed, no statistical analysis needed to be performed on the results.

<sup>b</sup>Multiple responses were given by some facilities.



who would notify the hospital to prepare for contaminated patients. Two hospitals had staff trained for radiological emergencies. All of the hospitals had standard operating procedures for treating contaminated patients.

## 2.9 AMBULANCES

Of the 89 ambulance companies and volunteer ambulance corps listed in the CRERP, 14 were included in the sample. Of those 14, three no longer exist; one was not operating at the time of the survey; and one is still operating, but repeated attempts to reach an official from this company were unsuccessful. From the completed nine surveys,

- Five (56%) of the companies were aware that they were designated to respond to radiological emergencies,
- Six (67%) had been contacted by the state or county,
- None had ambulances equipped with monitoring devices or potassium iodide (KI),
- Seven (78%) had ambulance crews that had been trained for radiological emergencies,
- Three (33%) had crews that had been trained in the care and treatment of radiologically injured or contaminated patients, and
- Two (22%) had standard operating procedures for ambulance crews treating radiologically injured patients.

Table 10 lists the questions and numerical results of the ambulance company survey.

### Orange County

Five ambulance companies were included in the sample for Orange County. Of these five, one had been disbanded and a second was also assumed to be disbanded because surveyors were unable to contact anyone who was aware of its existence. From the remaining three companies, one respondent was aware that the CRERP had designated the company to respond to radiological emergencies at Indian Point. One company had been contacted by the county. The ambulance crews of two of the three companies were trained for radiological emergencies. No ambulances were equipped with monitoring devices or KI.

Table 10 Results of the Survey of Ambulance Companies

| 1. Are you aware that your company is designated to respond to radiological emergencies in the Indian Point Radiological Emergency Response Plan? |                |                |                    |                     |
|---|----------------|----------------|--------------------|---------------------|
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 1 <sup>a</sup> | 3 <sup>b</sup> | 1 <sup>c</sup>     | 5 <sup>d</sup>      |
| No  | 2              | 1              | 1                  | 8 <sup>e,f</sup>    |
| 2. Who would notify you that your company is to provide services? <sup>g</sup>  |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Sheriff/police  | 2              | 2              | 1                  | 5                   |
| Civil defense   | 2              | 1              | 0                  | 3                   |
| County  | 0              | 1              | 0                  | 1                   |
| Don't know  | 0              | 0              | 2                  | 2                   |
| 3. How would you be notified that your company is to provide services? <sup>g</sup>   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Radio   | 3              | 3              | 1                  | 7                   |
| Telephone   | 2              | 1              | 0                  | 3                   |
| Police  | 0              | 0              | 1                  | 1                   |
| 4. Have you been contacted by the state or county to discuss your role in responding to an emergency at the Indian Point Nuclear Power Station?   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 1 <sup>a</sup> | 3 <sup>b</sup> | 2 <sup>h</sup>     | 6 <sup>i</sup>      |
| No  | 2              | 1              | 0                  | 7 <sup>e,f</sup>    |
| 4a. If yes, who contacted the company?  |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| County  | 0              | 1              | 1                  | 2                   |
| Civil defense   | 1              | 2              | 0                  | 3                   |
| Don't know  | 0              | 0              | 1                  | 1                   |
| 4b. If yes, when was the company contacted?   |                |                |                    |                     |
|   | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| 1983  | 0              | 0              | 2                  | 2                   |
| 1982  | 1              | 0              | 0                  | 1                   |
| Don't know  | 0              | 3              | 0                  | 3                   |

Table 10 (Cont'd)

| 5. Are ambulance crews of this facility trained for radiological emergencies that may take place at a nuclear power plant? |                |                |                    |                     |
|--|----------------|----------------|--------------------|---------------------|
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 2 <sup>j</sup> | 4 <sup>k</sup> | 1 <sup>c</sup>     | 7 <sup>l</sup>      |
| No   | 1              | 0              | 1                  | 6 <sup>e,f</sup>    |
| 6. What type of equipment is there to communicate with fixed and mobile facilities?  |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Radio  | 3              | 4              | 2                  | 9                   |
| Walkie-talkie  | 1              | 0              | 0                  | 1                   |
| Radio pager  | 1              | 0              | 0                  | 1                   |
| 7. Are ambulances equipped with monitoring devices?  |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 0              | 0              | 0                  | 0                   |
| No   | 3              | 3              | 2                  | 12 <sup>e,f</sup>   |
| Don't know   | 0              | 1              | 0                  | 1                   |
| 8. Are ambulance crews trained in the use of monitoring equipment and dosimeters?  |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Yes  | 0              | 1              | 0                  | 1                   |
| No   | 3              | 2              | 2                  | 12 <sup>e,f</sup>   |
| Don't know   | 0              | 1              | 0                  | 1                   |
| 9. Does the ambulance have the following equipment? (number of companies answering yes)                                    |                |                |                    |                     |
|  | <u>Orange</u>  | <u>Putnam</u>  | <u>Westchester</u> | <u>All Counties</u> |
| Gloves   | 2              | 3              | 2                  | 7                   |
| Blankets   | 2              | 4              | 2                  | 8                   |
| Waste containers   | 2              | 2              | 1                  | 5                   |
| Batteries  | 1              | 2              | 0                  | 3                   |
| Labels   | 2              | 2              | 2                  | 6                   |

Table 10 (Cont'd)

|   |               |               |                    |                     |
|---|---------------|---------------|--------------------|---------------------|
| 10. Are ambulance crews trained in the care and treatment of radiologically injured or contaminated patients?   |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 1             | 2             | 0                  | 3                   |
| No  | 2             | 2             | 2                  | 10 <sup>e,f</sup>   |
| 11. Are there standard operating procedures for ambulance crews treating patients that have radioactive wounds, gross contamination, or gross gamma whole body exposures? |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 1             | 1             | 0                  | 2                   |
| No  | 2             | 3             | 2                  | 11 <sup>e,f</sup>   |
| 12. Are ambulance crews trained in the use of potassium iodide and is it available for use?   |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Yes   | 0             | 0             | 0                  | 0                   |
| No  | 3             | 4             | 2                  | 13 <sup>e,f</sup>   |
| 13. Where do ambulance drivers transport patients?  |               |               |                    |                     |
|   | <u>Orange</u> | <u>Putnam</u> | <u>Westchester</u> | <u>All Counties</u> |
| Westchester County  |               |               |                    |                     |
| Medical Center  | 0             | 0             | 2                  | 2                   |
| Putnam Community Hospital   | 0             | 1             | 0                  | 1                   |
| Butterfield Hospital  | 0             | 1             | 0                  | 1                   |
| St. Anthony's Hospital  | 1             | 0             | 0                  | 1                   |
| Arden Hill Hospital   | 1             | 0             | 0                  | 1                   |
| Nearest hospital  | 2             | 0             | 0                  | 2                   |
| Don't know  | 0             | 2             | 0                  | 2                   |

<sup>a</sup>Confidence interval = (0.04,0.78), confidence level = 89%; confidence interval = (0.04,0.93), confidence level = 100%.

<sup>b</sup>Confidence interval = (0.36,0.91), confidence level = 91%; confidence interval = (0.27,0.91), confidence level = 100%.

<sup>c</sup>Confidence interval = (0.02,0.80), confidence level = 91%; confidence interval = (0.02,0.96), confidence level = 100%.

<sup>d</sup>Confidence interval = (0.18,0.63), confidence level = 90%; confidence interval = (0.06,0.91), confidence level = 100%.

<sup>e</sup>Includes one company that no longer exists and one company that commenced operations in Feb. 1983.

<sup>f</sup>Includes one company that has been disbanded and one company that apparently no longer exists.

<sup>g</sup>Multiple responses were given by some companies.

<sup>h</sup>Confidence interval = (0.31,1.00), confidence level = 91%; confidence interval = (0.04,1.00), confidence level = 100%.

<sup>i</sup>Confidence interval = (0.24,0.70), confidence level = 90%; confidence interval = (0.07,0.92), confidence level = 100%.

<sup>j</sup>Confidence interval = (0.22,0.96), confidence level = 89%; confidence interval = (0.07,0.96), confidence level = 100%.

<sup>k</sup>Confidence interval = (0.64,1.00), confidence level = 91%; confidence interval = (0.36,1.00), confidence level = 100%.

<sup>l</sup>Confidence interval = (0.30,0.76), confidence level = 90%; confidence interval = (0.08,0.93), confidence level = 100%.

#### Putnam County

In Putnam County, four ambulance companies were surveyed. All were associated with local fire departments. Three of the respondents questioned were aware that their companies were designated in the CRERP to respond to radiological emergencies at Indian Point, and three had been contacted by the state or county. All of the ambulance crews had received training for radiological emergencies. No ambulances were equipped with monitoring devices or KI.

#### Westchester County

Five ambulance companies in Westchester County were chosen to be sampled. One of these no longer exists, a second was not operating at the time of the survey, and surveyors were unable to reach an official from a third company, despite repeated attempts to do so. One of the other two company respondents was aware that the CRERP designated the company to respond to radiological emergencies at Indian Point, and both of these companies had been contacted by the state or county. One company had crews that had been trained for radiological emergencies. No ambulances were equipped with monitoring devices or KI.

### 2.10 PERSONNEL MONITORING CENTERS

Based upon an examination of the Orange, Westchester, and revised Putnam CRERPs, it was determined that personnel monitoring centers will be established as needed and where needed during a radiological emergency. Attachment 11 in Sec. 3 (Health) of the Orange CRERP reads in part:

During a radiological emergency, the County Commissioner of Health is responsible for the radiological exposure control of emergency response personnel. Activities associated with this responsibility include, but are not limited to, the following:  
. . . 7. Establishing facilities for the decontamination of exposed emergency personnel.

The revised Putnam CRERP states:

Personnel monitoring centers will be established at the time of an emergency outside but near the 10-mile EPZ. Locations will be communicated at the time to emergency team leaders and supervisors. (Attachment 12, County Radiological Officer)

Accordingly, since no sites in Orange County or Putnam County have been designated as personnel monitoring centers, it was impossible to survey such centers.

At the time of the verification analysis, the Westchester CRERP did not indicate where personnel monitoring centers will be located. Subsequent revisions to the plan state:

- 2.1 Appropriate personnel monitoring centers will be established and operational unless the determination is made by the County Chief Executive that none are needed because of the absence of a release of radioactive material sufficient to cause a contamination problem.
- 2.2 Personnel monitoring centers [PMCs] will be activated at the time of an emergency outside the 10-mile EPZ. Activation and locations will be communicated to emergency team leaders and supervisors and Commissioner/Sheriff in the event traffic control is required at PMC locations. The PMC for County Emergency Workers is currently the Westchester County Fire Training Center, Dana Road, Valhalla, N.Y. (Section 3, Attachment 13)

Since the facility at the Westchester County Fire Training Center was not originally included in the CRERP, the verification analysis could not include the facility.

APPENDIX A  
QUESTIONNAIRES USED IN THE SURVEY

BUS COMPANIES

B.C. Interview I.D. # \_\_\_\_\_  
 Interviewer \_\_\_\_\_  
 Verified by: \_\_\_\_\_ Date Completed \_\_\_\_\_  
           Telephone \_\_\_\_\_  
           Letter (received) \_\_\_\_\_  
           Field Visit \_\_\_\_\_

FEMA/REP VERIFICATION FORM

Indian Point Nuclear Generating Station

I. ORGANIZATION VERIFICATION DATA

|                               | Information taken from<br>_____ Plan | Verification Data<br>(if same as plan,<br>indicate "Same") |
|-------------------------------|--------------------------------------|--|
| <b>1. Company Information</b> |                                      |  |
| Company Name                  | _____                                | _____  |
| General Manager               | _____                                | _____  |
| Telephone Number              | _____                                | _____  |
| Business Address              | _____<br>_____                       | _____<br>_____   |
| <b>2. Garage Information</b>  |                                      |  |
| Garage Address                | _____                                | _____  |
| Telephone Number              | _____                                | _____  |
| Person in Charge              | _____                                | _____  |
| Title                         | _____                                | _____  |



B.C Interview I.D. # \_\_\_\_\_  
 Interviewer's Initials \_\_\_\_\_

II. QUESTIONNAIRE

PLAN

VERIFICATION  
 (enter response; put  
 D.K. if respondent  
 does not know)

1. Information source  
 being verified (check  
 one)

New York State Plan \_\_\_\_  
 County Plan \_\_\_\_\_  
 (Name of County)

2. How many buses and vans  
 do you have in your  
 garage?

|       |       |       |
|-------|-------|-------|
| Buses | _____ | _____ |
| Vans  | _____ | _____ |

3. On an average day, how  
 many buses and vans do  
 you have in working  
 condition?

|       |       |       |
|-------|-------|-------|
| Buses | _____ | _____ |
| Vans  | _____ | _____ |

4. What is the average  
 capacity of the buses  
 and vans that you have  
 in working condition  
 on an average day?

|       |       |       |
|-------|-------|-------|
| Buses | _____ | _____ |
| Vans  | _____ | _____ |

5. How many of your  
 vehicles are equipped  
 to transport handi-  
 capped, nonambulatory  
 individuals?

|       |       |
|-------|-------|
| _____ | _____ |
|-------|-------|

6. How many licensed bus  
 and van drivers do you  
 employ?

|       |       |
|-------|-------|
| _____ | _____ |
|-------|-------|

B.C. Interview I.D. # \_\_\_\_\_  
 Interviewer's Initials \_\_\_\_\_

II. QUESTIONNAIRE (Cont'd)

PLAN

VERIFICATION

7. How many vehicles do you use on an ordinary daily basis when schools are in session?

For schools (public and private)  
 For general population  
 For special facilities

|       |       |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

8. How many vehicles do you use on an ordinary daily basis when schools are not in session? (weekends, vacations, summers, etc.)

Not in use  
 For general population  
 For special facilities  
 Other (specify)

|       |       |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

9. Approximately how many of your vehicles are equipped with mobile communications equipment?

|       |       |
|-------|-------|
| _____ | _____ |
|-------|-------|

10. Have you or someone in your organization been contacted by State or County representatives to discuss your role in the Indian Point Radiological Emergency Response Plan?

\_\_\_\_\_ Yes  
 \_\_\_\_\_ No

Who \_\_\_\_\_ When \_\_\_\_\_

11. Does your organization have a formal agreement to supply vehicles in the event of a radiological emergency at the Indian Point Nuclear Generating Station?

Yes \_\_\_\_\_  
 No \_\_\_\_\_

\_\_\_\_\_ Date if known  
 No \_\_\_\_\_

Do not know

B.C. Interview I.D. # \_\_\_\_\_  
 Interviewer's Initials \_\_\_\_\_

II. QUESTIONNAIRE (Cont'd)                      PLAN                      VERIFICATION

12. Who would contact you and tell you to deploy your vehicles in the event an evacuation became necessary?                      \_\_\_\_\_                      \_\_\_\_\_

13. How would you be contacted? (e.g. phone, radio, etc.)                      \_\_\_\_\_                      \_\_\_\_\_

14. How would you notify your vehicle drivers to report to the garage in the event they were needed for an evacuation?                      \_\_\_\_\_                      \_\_\_\_\_

15. Is your garage located within the 10 mile Emergency Planning Zone?  
 No \_\_\_\_\_ Yes \_\_\_\_\_ (if yes, ask:  
 How will you communicate with your drivers if there is a total evacuation and your dispatcher must leave the garage?)  
 \_\_\_\_\_  
 \_\_\_\_\_

16. How many vehicles will you use if evacuation becomes necessary?

First wave (Total)                      \_\_\_\_\_                      \_\_\_\_\_  
 Schools                      \_\_\_\_\_                      \_\_\_\_\_  
 General Population                      \_\_\_\_\_                      \_\_\_\_\_  
 Special Facilities                      \_\_\_\_\_                      \_\_\_\_\_

Second wave (Total)                      \_\_\_\_\_                      \_\_\_\_\_  
 Schools                      \_\_\_\_\_                      \_\_\_\_\_  
 General Population                      \_\_\_\_\_                      \_\_\_\_\_  
 Special Facilities                      \_\_\_\_\_                      \_\_\_\_\_

B.C. Interview I.D. # \_\_\_\_\_  
Interviewer's Initials \_\_\_\_\_

II. QUESTIONNAIRE (Cont'd)

PLAN

VERIFICATION

17. Do you have maps or lists of evacuee pickup locations available for distribution to your vehicle drivers?

- \_\_\_\_\_ Yes
- \_\_\_\_\_ No
- \_\_\_\_\_ Other (specify)
- \_\_\_\_\_ Do not know

18. How many of your vehicle drivers have received formal training on radiological emergency response preparedness (including dosimetry, evacuation routes, etc.)

\_\_\_\_\_

19. Are your vehicle drivers scheduled to receive radiological emergency response training in the future?

- \_\_\_\_\_ Yes                      Date (if known) \_\_\_\_\_
- \_\_\_\_\_ No
- \_\_\_\_\_ Do not know

20. How many dosimeters do you have available for distribution to your drivers?

|                         |       |       |
|-------------------------|-------|-------|
| Low range self reading  | _____ | _____ |
| High range self reading | _____ | _____ |
| Film badges             | _____ | _____ |
| Total Dosimeters        | _____ | _____ |
| No. of bus drivers      | _____ | _____ |

21. Where are your dosimeters stored?

\_\_\_\_\_  
\_\_\_\_\_

RECEPTION CENTERS

R.C. Interview I.D. # \_\_\_\_\_  
 Interviewer \_\_\_\_\_  
 Verified by: \_\_\_\_\_ Date Completed \_\_\_\_\_  
           Telephone \_\_\_\_\_  
           Letter \_\_\_\_\_  
           Field Visit \_\_\_\_\_

FEMA/REP VERIFICATION FORM

Indian Point Nuclear Generating Station

I. ORGANIZATION VERIFICATION DATA

|  | Information taken from<br>_____ Plan | Verification Data<br>(if same plan,<br>indicate "same") |
|--|--------------------------------------|---|
| 1. Building Name                                 | _____                                | _____   |
| 2. Address                                       | _____                                | _____   |
|  | _____                                | _____   |
| 3. Telephone Number                              | _____                                | _____   |
| 4. Person in Charge<br>of Building               | _____                                | _____   |
| 5. Person in charge of<br>Congregate Care Center | _____                                | _____   |
| Telephone Number                                 | _____                                | _____   |
| 6. Is this a school?                             |                                      |   |
|  | _____ Yes                            |   |
|  | _____ No                             |   |

## II. QUESTIONNAIRE

Questions to be asked of person in charge of normal building operations:

1. Are you aware that your building is designated as a Reception Center in the Indian Point Radiological Emergency Response Plan?

Yes  
 No (if no, ask who is "in charge" of the building and ask the questions of that person)

2. Who would notify you that your building is to be activated as a Reception Center?

Name \_\_\_\_\_ Don't know \_\_\_\_\_

3. How would you be notified that your building is to be activated as a Reception Center?

Telephone  
 Radio  
 Other (specify) \_\_\_\_\_  
 Don't know

4. Is your building utilized 12 months a year?

Yes  
 No

5. Who is authorized to open the building after working hours (and weekends, vacations, summers if applicable) in case it is needed as a Reception Center during a radiological emergency?

Don't know \_\_\_\_\_

6. Is there a back-up person name available in case the regular person isn't available?

Yes \_\_\_\_\_ Name \_\_\_\_\_  
 No \_\_\_\_\_  
 Don't know \_\_\_\_\_

## II. QUESTIONNAIRE (Cont'd)

7. What is the normal daily occupancy of your building?

\_\_\_\_\_ persons

8. What is the capacity of your parking lot?

\_\_\_\_\_ automobiles  
\_\_\_\_\_ buses/vans

9. Are there showers in your building?

Yes \_\_\_\_\_ How many male? \_\_\_\_\_  
No \_\_\_\_\_ How many female? \_\_\_\_\_

10. Approximately how many toilets are there in your building?

\_\_\_\_\_ Male  
\_\_\_\_\_ Female

11. In the event of a radiological emergency at the Indian Point Nuclear Generating Station, who is in charge of operations at the Reception Center to be located in your building?

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_

Telephone Numbers

Business \_\_\_\_\_  
Home \_\_\_\_\_

(Ask only for a reception center located in a school)

12. Do you have any plans for your own students if you are notified that your school will be used as a reception center?

No \_\_\_\_\_  
Yes \_\_\_\_\_ If yes, briefly describe them. \_\_\_\_\_  
\_\_\_\_\_

## III. QUESTIONNAIRE

Questions to be asked of person in charge of reception center at

\_\_\_\_\_.  
(if respondent does not know, indicate with D.K.)

1. Who would notify you that your Reception center is to be activated.  
\_\_\_\_\_

2. How would you receive this notification?

Telephone \_\_\_\_\_ EBS message \_\_\_\_\_  
Radio \_\_\_\_\_ Other \_\_\_\_\_

3. How many staff are assigned to the facility?  
\_\_\_\_\_

4. Are there enough personnel to staff more than one shift?

Yes \_\_\_\_\_ No \_\_\_\_\_

5. Are all personnel assigned to work in the facility trained in handling mass evacuees?

Yes \_\_\_\_\_ No \_\_\_\_\_

6. Do you have forms for registering people who come to the facility?

Yes \_\_\_\_\_ No \_\_\_\_\_

7. Is there a capability for decontamination and radiation monitoring?

Yes \_\_\_\_\_ No \_\_\_\_\_

(Ask questions 8, 9, 10 and 11 only if yes to 7)

8. Are you able to:

|                         |           |          |
|-------------------------|-----------|----------|
| Monitor people?         | Yes _____ | No _____ |
| Decontaminate people?   | Yes _____ | No _____ |
| Monitor vehicles?       | Yes _____ | No _____ |
| Decontaminate vehicles? | Yes _____ | No _____ |

9. Do you have procedures to handle waste generated during contamination of people and vehicles?

|               |           |          |
|---------------|-----------|----------|
| Solid waste?  | Yes _____ | No _____ |
| Liquid waste? | Yes _____ | No _____ |



III. QUESTIONNAIRE (Cont'd)

10. Do you have a supply of clothing for use in place of contaminated clothing?

Yes \_\_\_\_\_ No \_\_\_\_\_

11. Where can additional supplies be obtained?

\_\_\_\_\_

12. How would the Reception center maintain communications with the county Emergency Operations Center?

Telephone \_\_\_\_\_ Radio \_\_\_\_\_ Other (Specify) \_\_\_\_\_

13. How would the Reception center maintain communications with Congregate Care Center?

Telephone \_\_\_\_\_ Radio \_\_\_\_\_ Same location \_\_\_\_\_  
Other (Specify) \_\_\_\_\_

14. From whom would you receive notifications on the status of the emergency?

County EOC \_\_\_\_\_ EBS reports \_\_\_\_\_ Other (Specify) \_\_\_\_\_

CONGREGATE CARE RELOCATION CENTERS

C.C.R.C. Interview I.D. # \_\_\_\_\_  
 Interviewer \_\_\_\_\_  
 Verified by: \_\_\_\_\_ Date Completed \_\_\_\_\_  
 Telephone \_\_\_\_\_  
 Letter \_\_\_\_\_  
 Field Visit \_\_\_\_\_

FEMA/REP VERIFICATION FORM

Indian Point Nuclear Generating Station

I. ORGANIZATION VERIFICATION DATA

|   | Information taken from<br>_____ Plan | Verification Data<br>(if same plan,<br>indicate "same") |
|---|--------------------------------------|---|
| 1. Building Name                                    | _____                                | _____   |
| 2. Address  | _____<br>_____                       | _____<br>_____  |
| 3. Telephone Number                                 | _____                                | _____   |
| 4. Person in Charge<br>of Building                  | _____                                | _____   |
| 5. Person in Charge<br>of Congregate Care<br>Center | _____                                | _____   |
| Telephone Number                                    | _____                                | _____   |
| 6. Is this a school?                                | _____ Yes<br>_____ No                |   |

## II. QUESTIONNAIRE

Questions to be asked of person in charge of normal building operations:  
(if respondent does not know, indicate with D.K.)

1. Are you aware that your building is designated as a Congregate Care Center in the Indian Point Radiological Emergency Response Plan?

\_\_\_\_\_ Yes  
\_\_\_\_\_ No (if no, ask who is "in charge" of the building and ask the questions of that person)

2. Who would notify you that your building is to be activated as a Congregate Care Center?

Name \_\_\_\_\_ Don't know \_\_\_\_\_

3. How would you be notified that your building is to be activated as a Congregate Care Center?

\_\_\_\_\_ Telephone  
\_\_\_\_\_ Radio  
\_\_\_\_\_ Other (specify) \_\_\_\_\_

4. Is your building utilized 12 months a year?

\_\_\_\_\_ Yes  
\_\_\_\_\_ No

5. Who is authorized to open the building after working hours (and weekends, vacations, summers, if applicable) in case it is needed as a Congregate Care Center during a radiological emergency? \_\_\_\_\_

6. Is there a back-up person available in case the regular person isn't available?

\_\_\_\_\_ Yes  
\_\_\_\_\_ No Name \_\_\_\_\_

## II. QUESTIONNAIRE (Cont'd)

7. What is the normal daily occupancy of your building?

\_\_\_\_\_ persons

8. What is the capacity of your parking lot?

\_\_\_\_\_ Automobiles  
\_\_\_\_\_ buses/vans

9. Are there showers in your building?

Yes \_\_\_\_\_ How many male? \_\_\_\_\_  
No \_\_\_\_\_ How many female? \_\_\_\_\_

10. Approximately how many toilets are there in your building?

\_\_\_\_\_ Male  
\_\_\_\_\_ Female

11. In the event of a radiological emergency at the Indian Point Nuclear Generating Station, who is in charge of operations at the Congregate Care Center to be located in your building?

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_

Telephone Numbers  
Business \_\_\_\_\_  
Home \_\_\_\_\_

12. Do you have any plans for your students if you are notified that your school will be used as a reception center:

\_\_\_\_\_ No  
\_\_\_\_\_ Yes If yes, please briefly describe them.

\_\_\_\_\_

\_\_\_\_\_

## III. QUESTIONNAIRE

Questions to be asked of person in charge of Congregate Care Center at \_\_\_\_\_.

(if respondent does not know, indicate with D.K.)

1. Who would notify you that your Congregate Care Center is to be activated?  
\_\_\_\_\_

2. How would you receive this notification?

Telephone \_\_\_\_\_ EBS Message \_\_\_\_\_  
Radio \_\_\_\_\_ Other \_\_\_\_\_

3. What is the capacity of the facility?  
\_\_\_\_\_

4. How many personnel are assigned to the facility?  
\_\_\_\_\_

5. Are there enough personnel to staff more than one shift?

Yes \_\_\_\_\_ No \_\_\_\_\_

6. Are all personnel assigned to work in the facility trained in handling mass evacuees?

Yes \_\_\_\_\_ No \_\_\_\_\_

If no, how many individuals have been trained? \_\_\_\_\_

7. Do you have procedures for handling people arriving without papers indicating that they have been processed at a reception center?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

8. If yes, what are your procedures:  
\_\_\_\_\_?

9. (If yes to 7) Can your facility be configured to maintain a separation between people who have been processed through a reception center and those who have not?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

10. Are sleeping accommodations (beds, cots, blankets) provided?

Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, how many \_\_\_\_\_

11. How would the Congregate Care Center maintain communications with the County Emergency Operation Center?

Telephone \_\_\_\_\_ Radio \_\_\_\_\_ Other (specify) \_\_\_\_\_

III. QUESTIONNAIRE (Cont'd)

12. How would the center maintain communications with the Reception Center?

Telephone \_\_\_\_\_ Radio \_\_\_\_\_ Same location \_\_\_\_\_ Other (specify) \_\_\_\_\_

13. From whom would you receive emergency notification on the status of the emergency?

County EOC \_\_\_\_\_ EBS Reports \_\_\_\_\_ Other (Specify) \_\_\_\_\_

SCHOOLS TO BE EVACUATED

School Interview I.D. # \_\_\_\_\_  
 Interviewer \_\_\_\_\_  
 Verified by: \_\_\_\_\_ Date Completed \_\_\_\_\_  
           Telephone \_\_\_\_\_  
           Letter \_\_\_\_\_  
           Field Visit \_\_\_\_\_

FEMA/REP VERIFICATION FORM

Indian Point Nuclear Generating Station

I. ORGANIZATION VERIFICATION DATA

|                                     | Information taken from<br>_____ Plan | Verification Data<br>(if same plan,<br>indicate "same") |
|-------------------------------------|--------------------------------------|---|
| 1. School Name                      | _____                                | _____   |
| 2. Address                          | _____                                | _____   |
| 3. Person in Charge<br>of School    | _____                                | _____   |
| 4. Telephone Number                 | _____                                | _____   |
| 5. Is school still in<br>operation? |                                      |   |
|                                     | Yes _____                            | No _____  |

## II. QUESTIONNAIRE

1. How many students attend your school? \_\_\_\_\_
2. What hours is your school in session? \_\_\_\_\_
3. Have you or someone in your school been contacted to discuss your role in the Indian Point Radiological Emergency Response Plan?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes,

Who (name) \_\_\_\_\_ When \_\_\_\_\_

Title/Organization \_\_\_\_\_

4. Have you or any of your staff received any training in procedures for evacuating your school?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes, what? \_\_\_\_\_

5. Are any training sessions planned?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes, details (what, when) \_\_\_\_\_

6. Who will contact you to tell you that your school is to be evacuated?

Name \_\_\_\_\_ Title \_\_\_\_\_

7. How will you be contacted?

\_\_\_\_\_ Telephone  
 \_\_\_\_\_ Tone alert radio  
 \_\_\_\_\_ Other (specify) \_\_\_\_\_

8. Do you have a tone alert radio in your school?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

9. Are you responsible for contacting any other schools or facilities in your area to inform them that they are to be evacuated?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If so, which one(s)?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



II. QUESTIONNAIRE (Cont'd)

10. Have you been informed who will provide buses if evacuation becomes necessary?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes, who? \_\_\_\_\_

11. Have you been informed where your students will be taken initially if your school is evacuated?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes, where? \_\_\_\_\_

SCHOOL DISTRICTS WITHIN  
THE PLUME EXPOSURE EPZ

School District Interview I.D. # \_\_\_\_\_  
Interviewer \_\_\_\_\_  
Verified by: \_\_\_\_\_ Date Completed \_\_\_\_\_  
Telephone \_\_\_\_\_  
Letter \_\_\_\_\_  
Field Visit \_\_\_\_\_

FEMA/REP VERIFICATION FORM

Indian Point Nuclear Power Station

I. ORGANIZATION VERIFICATION DATA

- 1. School District Name \_\_\_\_\_
- 2. Address \_\_\_\_\_
- 3. Superintendent of Schools \_\_\_\_\_
- 4. Telephone Number \_\_\_\_\_

## II. QUESTIONNAIRE (Cont'd)

1. How many schools are in this district which are within the plume exposure emergency planning zone?

\_\_\_\_\_

2. Have you or someone on your staff been contacted by the state or county to discuss your role in the Indian Point Radiological Emergency Response Plan?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes,  
Who (name) \_\_\_\_\_, When \_\_\_\_\_  
Title/Organization \_\_\_\_\_

3. Have you or any of your staff received any training in procedures for evacuating the schools in your district?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes, please briefly describe.

\_\_\_\_\_

4. Are any training sessions planned?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes, please give details (when, what)?

\_\_\_\_\_

5. Who will contact you to tell you that some or all of the schools in your district are to be evacuated?

Name \_\_\_\_\_ Title \_\_\_\_\_

6. How will you be contacted?

\_\_\_\_\_ Telephone  
\_\_\_\_\_ Tone alert radio  
\_\_\_\_\_ Other (specify) \_\_\_\_\_

7. Is there a tone alert radio in the district offices?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

8. Are you responsible for contacting any other schools or facilities in your area to inform them that they are to be evacuated?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If so, which ones(s)?

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SPECIAL FACILITIES TO BE EVACUATED

S. F. Interview I.D. # \_\_\_\_\_  
 Interviewer \_\_\_\_\_  
 Verified by: \_\_\_\_\_ Date Completed \_\_\_\_\_  
           Telephone \_\_\_\_\_  
           Letter \_\_\_\_\_  
           Field Visit \_\_\_\_\_

FEMA/REP VERIFICATION FORM

Indian Point Nuclear Power Station

I. ORGANIZATION VERIFICATION DATA

|                                    | Information taken from<br>_____ Plan                | Verification Data<br>(if same plan,<br>indicate "same") |
|------------------------------------|---|---|
| 1. Facility Type                   | _____ Hospital _____<br>_____ Other (specify) _____ | Nursing Home _____                                      |
| 2. Facility Name                   | _____   | _____   |
| 3. Address                         | _____   | _____   |
| 4. Person in charge<br>of facility | _____   | _____   |
| 5. Title/Position                  | _____   | _____   |
| 6. Telephone Number                | _____   | _____   |

## II. QUESTIONNAIRE

1. How many patients and residents do you have, on average?

\_\_\_\_\_

2. On average, how many:

are ambulatory? \_\_\_\_\_  
 require a wheelchair? \_\_\_\_\_  
 require a stretcher? \_\_\_\_\_

3. Have you been contacted by the state or county to discuss your role in the Indian Point Radiological Emergency Response Plan?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes,

Who \_\_\_\_\_, When \_\_\_\_\_  
 Title/Organization \_\_\_\_\_

4. Have you or your staff received any training in procedures for evacuating the residents in your facility?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes, describe briefly:

\_\_\_\_\_

\_\_\_\_\_

5. Are training sessions planned:

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes, please describe briefly:

\_\_\_\_\_

\_\_\_\_\_

6. Who will contact you to tell you that your facility is to be evacuated?

Name \_\_\_\_\_ Title \_\_\_\_\_

7. How will you be contacted?

\_\_\_\_\_ Telephone  
 \_\_\_\_\_ Tone alert radio  
 \_\_\_\_\_ Other (specify) \_\_\_\_\_

8. Is there a tone alert radio in your facility?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

## II. QUESTIONNAIRE (Cont'd)

9. How many facility-owned vehicles do you have available for evacuation of your residents?

\_\_\_\_\_ Buses  
\_\_\_\_\_ Vans  
\_\_\_\_\_ Ambulances

10. If this number is inadequate, how many additional vehicles would be needed?

\_\_\_\_\_ Buses  
\_\_\_\_\_ Vans  
\_\_\_\_\_ Ambulances

Who will provide them?

\_\_\_\_\_

11. What facility will act as the reception center for your residents?

Name \_\_\_\_\_ Location \_\_\_\_\_

## HOSPITALS

H. Interview I.D. # \_\_\_\_\_  
 Interviewer \_\_\_\_\_  
 Verified by: \_\_\_\_\_ Date Completed \_\_\_\_\_  
           Telephone \_\_\_\_\_  
           Letter \_\_\_\_\_  
           Field Visit \_\_\_\_\_

## FEMA/REP VERIFICATION FORM

Indian Point Nuclear Generating Station

## I. ORGANIZATION VERIFICATION DATA

|                     | Information taken from<br>_____ Plan | Verification Data<br>(if same plan,<br>indicate "same") |
|---------------------|--------------------------------------|---|
| 1. Hospital Name    | _____                                | _____   |
| 2. Address          | _____                                | _____   |
|                     | _____                                | _____   |
| 3. Telephone Number | _____                                | _____   |
| 4. Person in Charge |                                      |   |
| Radiological        |                                      |   |
| Emergency Response  | _____                                | _____   |



## II. QUESTIONNAIRE

Questions to be asked of person in charge of Radiological Emergency Response at the facility:

1. Do you know that this hospital may be used for emergency treatment of patients if there is an emergency at the Indian Point Nuclear Power Station?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

2. Who would notify you that your hospital should prepare for potentially contaminated injured patients?

\_\_\_\_\_ Name \_\_\_\_\_ Don't know \_\_\_\_\_

3. How would you be notified?

Telephone \_\_\_\_\_

Radio \_\_\_\_\_

Other (specify) \_\_\_\_\_

4. Have you been contacted by the state or county to discuss your role in responding to an emergency at the Indian Point Nuclear Power Stations:

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If Yes,  
By Whom \_\_\_\_\_ When \_\_\_\_\_

Title/Organization \_\_\_\_\_

5. Is the staff of this facility trained for Radiological Emergencies that may take place at a nuclear power station?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If Yes,

Is there a Health Physicist on the staff Yes \_\_\_\_\_ No \_\_\_\_\_

Is there a Health Physics Technician Yes \_\_\_\_\_ No \_\_\_\_\_

An X-Ray technician with H.P. training Yes \_\_\_\_\_ No \_\_\_\_\_

6. Are dosimeters provided for personnel who will be caring for contaminated injured persons?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

## II. QUESTIONNAIRE (Cont'd)

If Yes,  
What type of dosimeters are used,

\_\_\_\_\_ Pocket self reading  
 \_\_\_\_\_ Film Badge  
 \_\_\_\_\_ TLDS

7. Are there survey instruments available?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If yes,  
What type? explain briefly \_\_\_\_\_

8. Can an area be set aside for the treatment of radioactive contaminated patients that is separate from normal hospital operations?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

9. Are there sinks, showers and change areas?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

10. Are there facilities for waste containment and/or disposal?

Yes \_\_\_\_\_ No \_\_\_\_\_

Solids? \_\_\_\_\_  
 Liquids? \_\_\_\_\_  
 Can they be disposed? \_\_\_\_\_

11. Are communications available to communicate with fixed and mobile facilities?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If Yes,  
What is used?  
Telephone \_\_\_\_\_  
Radio \_\_\_\_\_  
Radio pagers \_\_\_\_\_

12. Are there Standard Operating Procedures for hospital personnel treating patients who have radioactive contaminated wounds, gross contamination or gross gamma whole body exposures?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

II. QUESTIONNAIRE (Cont'd)

If this facility cannot treat contaminated patients, what hospitals with capabilities for doing blood chemistry and whole body scanning are mentioned in the SOP's?

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## AMBULANCE COMPANIES

A.C. Interview I.D. # \_\_\_\_\_  
 Interviewer \_\_\_\_\_  
 Verified by: \_\_\_\_\_ Date Completed \_\_\_\_\_  
           Telephone \_\_\_\_\_  
           Letter \_\_\_\_\_  
           Field Visit \_\_\_\_\_

## FEMA/REP VERIFICATION FORM

Indian Point Nuclear Generating Station

## I. ORGANIZATION VERIFICATION DATA

|                                   | Information taken from<br>_____ Plan | Verification Data<br>(if same plan,<br>indicate "same") |
|-----------------------------------|--------------------------------------|---|
| 1. Company Name                   | _____                                | _____   |
| 2. Address                        | _____<br>_____                       | _____<br>_____  |
| 3. Telephone Number               | _____                                | _____   |
| 4. Person in Charge<br>of Company | _____                                | _____   |

## II. QUESTIONNAIRE

Questions to be asked of person in charge of Radiological Emergency Response at Ambulance Services.

1. Are you aware that your company is designated to respond to radiological emergencies in the Indian Point Radiological Emergency Response Plan?

\_\_\_\_\_ Yes  
 \_\_\_\_\_ No (if no, ask who is "in charge" of the company and ask the questions of that person)

2. Who would notify you that your company is to provide services?

Name \_\_\_\_\_ Don't know \_\_\_\_\_

3. How would you be notified that your company is to provide services?

\_\_\_\_\_ Telephone  
 \_\_\_\_\_ Radio  
 \_\_\_\_\_ Other (specify) \_\_\_\_\_

4. Have you been contacted by the state or county to discuss your role in responding to an emergency at the Indian Point Nuclear Power Station?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If Yes,  
 By Who \_\_\_\_\_ When \_\_\_\_\_

Title/Organization \_\_\_\_\_

5. Are the ambulance crews of this facility trained for Radiological Emergencies that may take place at a nuclear power plant?

If Yes,  
 By Whom \_\_\_\_\_ When \_\_\_\_\_

Title/Organization \_\_\_\_\_

6. Is there equipment to communicate with fixed and mobile facilities?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If Yes,  
 What type?  
 Radio \_\_\_\_\_  
 Radio pagers \_\_\_\_\_  
 Walkie-talkie \_\_\_\_\_

## II. QUESTIONNAIRE (Cont'd)

7. Are ambulances equipped with monitoring devices?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If Yes,

What type?

Survey meters \_\_\_\_\_

Dosimeters, pocket self reading \_\_\_\_\_

TLDs or film badges \_\_\_\_\_

8. Are ambulance crews trained in the use of monitoring equipment and dosimeters?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If Yes,

By Whom \_\_\_\_\_ When \_\_\_\_\_

Title/Organization \_\_\_\_\_

9. Does the ambulance have the following equipment?

Gloves (rubber or plastic) \_\_\_\_\_

Blankets or coverings (plastic or paper) \_\_\_\_\_

Plastic bags or large metal cans for wastes \_\_\_\_\_

Batteries for survey instruments \_\_\_\_\_

Tags, labels, tape \_\_\_\_\_

10. Are ambulance crews trained in the care and treatment of radiologically injured or contaminated patients?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

If Yes,

By Whom \_\_\_\_\_ When \_\_\_\_\_

Title/Organization \_\_\_\_\_

11. Are there standard operating procedures for ambulance crews treating patients that have radioactive wounds, gross contamination or gross gamma whole body exposures?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

12. Potassium iodide (KI) as a radioactive iodine blocker is used for protection against the uptake radioactive iodine that may be present during an accident at nuclear power stations. Are ambulance crews trained in the use of this drug and is it available for use?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

II. QUESTIONNAIRE (Cont'd)

13. Where do ambulance drivers transport patients?

\_\_\_\_\_ Don't know \_\_\_\_\_  
Place





APPENDIX B  
CONFIDENCE INTERVALS

## Introduction

In many practical situations, statistical and probability theory can be used to analyze the information obtained by surveys. In particular, a confidence interval can be placed around an estimate of the presence or absence of some characteristic in a population by taking random samples of only a portion of that population.\* For example, a confidence interval can be placed around the estimated number of institutions prepared to meet a radiological emergency by randomly sampling only a fraction of these institutions. For this and similar situations in which sampling all members of the population is expensive or impossible, statistical and probability theory is used to interpret information from a given set of samples. This theory allows one, for example, to estimate the characteristic of interest and place a "C x 100%" confidence interval around that estimate. The general theory further states that C x 100% of all such confidence intervals so constructed will in fact contain the "true" value. The confidence limits are upper and lower bounds.

## Theory

Consider a population of N objects, K of which are "successes" (prepared, for example), and N - K of which are "not successes" (not prepared). If a random sample of size NS is taken from the population of N, then the hypergeometric probability function provides the probability that X objects of those NS randomly sampled without replacement will be successes, given that K of the N objects in the whole population are successes. The hypergeometric probability function is defined as

$$f(X; N, NS, K) = \frac{\binom{K}{X} \binom{N-K}{NS-X}}{\binom{N}{NS}}$$

where the "combination" or "binomial coefficient" expression is

$$\binom{a}{b} = \frac{a!}{(a-b)!b!}$$

and the factorial is defined as

$$a! = a(a-1)(a-2)(a-3)\dots(3)(2)(1)$$

---

\*A confidence interval is a range of values which may or may not include the parameter of interest. The degree of belief (which should not be interpreted as a probability) that the confidence interval actually contains the true value is the confidence level.

The cumulative hypergeometric distribution function is defined as the probability of finding  $X$  or fewer successes in a random sample of  $NS$  objects from a population of  $N$  objects. Mathematically this is written as:

$$F(X; N, NS, K) = \sum_{r=0}^X \frac{\binom{K}{r} \binom{N-K}{NS-r}}{\binom{N}{NS}} = \sum_{r=0}^X f(r; N, NS, K)$$

The tables of Appendix C provide individual and cumulative values of the hypergeometric distribution for  $N = 2$  to 12, for all possible combinations of  $NS$ ,  $K$  and  $X$ .\*

To illustrate the use of the tables, consider the first page of Appendix C; the first entry in the right-hand column indicates that there is a 0.60 probability of having 1 success out of 2 items selected randomly from a population of 5 in which there are a total of 3 successes. There is also a 0.70 probability of selecting either 0 or 1 successful item under the same conditions.

These tables can be used to construct an approximate  $C \times 100\%$  confidence interval around an estimate of  $K$ . The confidence intervals will generally be approximate due to the discrete nature of the hypergeometric distribution. Denote  $K_u$  as the upper limit and  $K_l$  as the lower limit for the estimate of  $K$  where:

$$K_u = \text{smallest } K \text{ such that } F(X; N, NS, K) \leq (1 - C)/2$$

and

$$K_l = \text{largest } K \text{ such that } F(X - 1; N, NS, K) \geq (1 + C)/2$$

When the above equation yields a value of  $K$  less than  $X$ , due to the discrete nature of the hypergeometric distribution and the definition of confidence intervals,  $K_l$  is taken to be  $X$ .

$K_u$  and  $K_l$  provide a  $C \times 100\%$  confidence interval for the proportion of successes, namely,  $K_l/N \leq K_u/N$ ; the observed proportion of successes is  $X/NS$ . It follows that  $K_l/N \leq X/NS \leq K_u/N$ .

#### Example

Consider a case in which  $N = 11$ ,  $NS = 5$ ,  $X = 1$  and  $C = 0.80$ . That is, the statistician wants 80% confidence that the true value of  $K$  lies between

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\*Additional values for those cases where  $F(\bullet) \leq 0.20$  or  $F(\bullet) \geq 0.80$  were also tabulated and can be obtained on microfiche from Ron Whitfield, Argonne National Laboratory.

the values  $K_L$  and  $K_U$ , given that 1 out of 5 samples was successful from a total population of 11. Using the tables, the following is found:

| <u>K</u> | <u>F(1; 11, 5, K)</u> | <u>F(0; 11, 5, K)</u> |
|----------|-----------------------|-----------------------|
| 1        | 1.000                 | 1.00                  |
| 2        | 0.818                 | 0.545                 |
| 3        | 0.516                 | 0.273                 |
| 4        | 0.348                 | 0.121                 |
| 5        | 0.175                 | 0.045                 |
| 6        | 0.067                 |                       |
| 7        | 0.015                 |                       |

$K_U$  is determined by finding the smallest value of  $K$  such that  $F(1; 11, 5, K) \leq 0.1$ ; this value is  $K_U = 6$ .  $K_L$  is determined by finding the largest value of  $K$  such that  $F(0; 11, 5, K) \geq 0.9$ ; this value is 0, but is less than the observed number of successes; therefore  $K_L = 1$ . As a result, the statistician is approximately 80% confident that the true value of the number of successes in a population of 11 is between 1 and 6, given that 1 success was found in 5 random samples drawn from these 11. To be more precise, the interval 2 to 8 is a 93.3% confidence interval. Similarly, the interval 1 to 5 is an 82.5% confidence interval.

A 93.3% confidence interval on the proportion of successes is 0.09 to 0.55; the observed proportion is 0.20.

#### Choice of Confidence Intervals

Confidence intervals are constructed by first observing that the hypergeometric distribution properly describes the probabilities of observing the various outcomes while sampling (without replacement) fewer than all of the members of a finite population. It is important to use this distribution when the population of interest is small or the percent sampled is large (both usually apply here) in order to obtain correct results and conclusions. The theory of confidence intervals is used to construct upper and lower bounds for the estimated parameters. These bounds are influenced by the size of the population of interest, the number of samples taken, and the observed results.

When confidence intervals are stated in this report, usually both an approximate 90% and a 100% confidence interval are given. The 100% confidence interval is not a statistical device, but represents the possible minimum and maximum values implied by the sample. The approximate 90% confidence intervals are statistical devices; they are approximate due to the discrete nature of the hypergeometric distribution (i.e., it deals with integer numbers). It is not possible or meaningful to construct an approximate 90% confidence interval when the population of interest is too small. This problem does arise if all or almost all of the population can be sampled; in such a case, an exact (or nearly exact) estimate can be obtained.

Confidence intervals usually can be located at any number of places in the allowable interval (i.e., the 100% confidence interval). The following principles were used to set the confidence intervals listed in this report:

- The confidence level was chosen to be as close as possible to 90%.
- If moving the confidence interval a small distance to the right of the lowest possible value (0.07 in Fig. 1) decreases the maximum confidence level below about 85%, then the low end of the confidence interval is set at the lowest possible value (i.e., the 86% confidence interval is appropriate).
- A similar argument applies to locating the confidence interval if the observed proportion is near 1.00, as illustrated in Fig. 2. The 88% confidence interval, which has its high end at the highest possible value (0.87), is the appropriate choice.
- When possible, the confidence interval is "shortened" at both ends, as illustrated in Fig. 3. In this case, there is 95% confidence that the true proportion is greater than or equal to 0.18, 95% confidence that it is less than or equal to 0.63, and therefore 90% confidence that it is in the range 0.18 to 0.63. A qualitative argument for preferring the 90% confidence interval to the 89% confidence interval in Fig. 3 is that the 90% confidence interval is more conservative in estimating the upper bound on the proportion. This conservative interval seems to be appropriate since the observed proportion is 0.38.

Population Size 15  
 Sample Size 9  
 Number Answering "Yes" 1

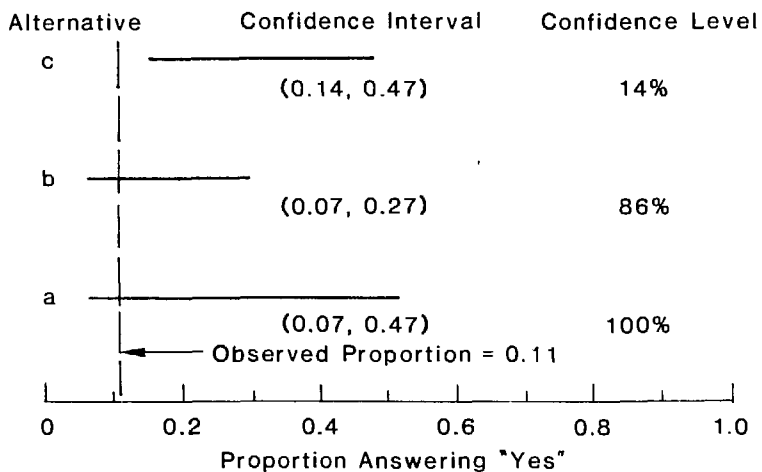


Fig. 1 Choice of Confidence Intervals for the Bus Company Category -- Low Proportion Observed

Population Size 15  
 Sample Size 9  
 Number Answering "Yes" 7

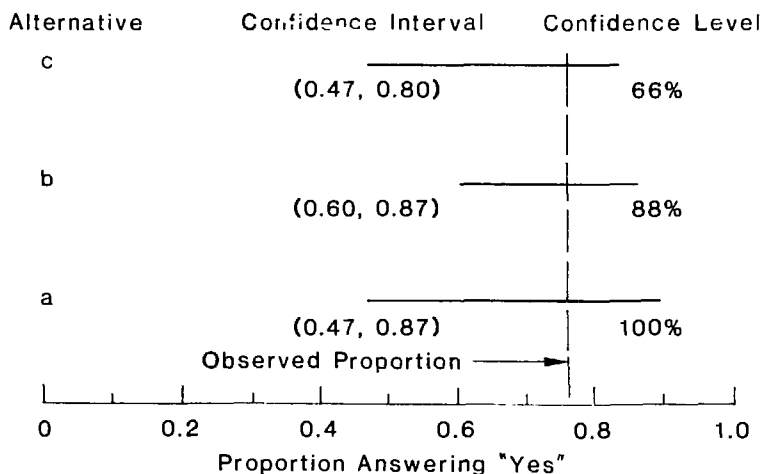


Fig. 2 Choice of Confidence Intervals for the Bus Company Category -- High Proportion Observed

Population Size            89  
 Sample Size                13  
 Number Answering "Yes"   5

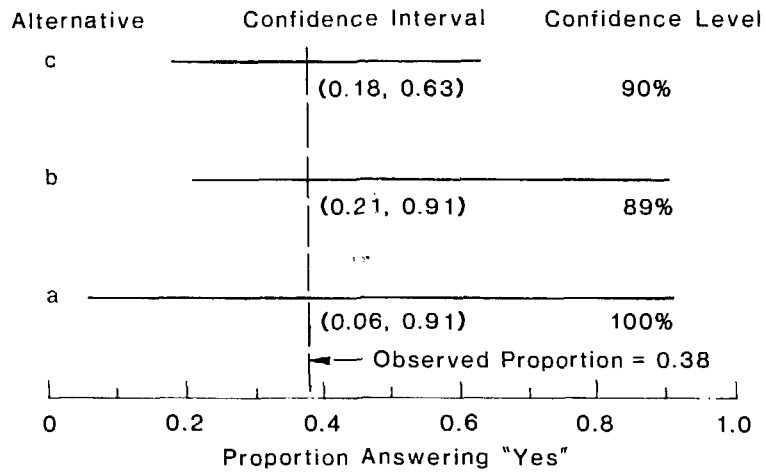


Fig. 3 Choice of Confidence Intervals for the Ambulance Companies Category





APPENDIX C

INDIVIDUAL AND CUMULATIVE  
PROBABILITIES  
FOR THE  
HYPERGEOMETRIC DISTRIBUTION  
FOR

$N = 2, \dots, 12$

$NS = 1, \dots, N-1$

$K = 1, \dots, N$

$X = 0, \dots, NS$

| N | NS | K | X | P(<=X)   | P(=X)    | N | NS | K | X | P(<=X)   | P(=X)    |
|---|----|---|---|----------|----------|---|----|---|---|----------|----------|
| 2 | 1  | 1 | 0 | 0.500000 | 0.500000 | 5 | 2  | 3 | 1 | 0.700000 | 0.600000 |
| 2 | 1  | 1 | 1 | 1.000000 | 0.500000 | 5 | 2  | 3 | 2 | 1.000000 | 0.300000 |
| 2 | 1  | 2 | 1 | 1.000000 | 1.000000 | 5 | 2  | 4 | 1 | 0.400000 | 0.400000 |
| 3 | 1  | 1 | 0 | 0.666667 | 0.666667 | 5 | 2  | 4 | 2 | 1.000000 | 0.600000 |
| 3 | 1  | 1 | 1 | 1.000000 | 0.333333 | 5 | 2  | 5 | 2 | 1.000000 | 1.000000 |
| 3 | 1  | 2 | 0 | 0.333333 | 0.333333 | 5 | 3  | 1 | 0 | 0.400000 | 0.400000 |
| 3 | 1  | 2 | 1 | 1.000000 | 0.666667 | 5 | 3  | 1 | 1 | 1.000000 | 0.600000 |
| 3 | 1  | 3 | 1 | 1.000000 | 1.000000 | 5 | 3  | 2 | 0 | 0.100000 | 0.100000 |
| 3 | 2  | 1 | 0 | 0.333333 | 0.333333 | 5 | 3  | 2 | 1 | 0.700000 | 0.600000 |
| 3 | 2  | 1 | 1 | 1.000000 | 0.666667 | 5 | 3  | 2 | 2 | 1.000000 | 0.300000 |
| 3 | 2  | 2 | 1 | 0.666667 | 0.666667 | 5 | 3  | 3 | 1 | 0.300000 | 0.300000 |
| 3 | 2  | 2 | 2 | 1.000000 | 0.333333 | 5 | 3  | 3 | 2 | 0.900000 | 0.600000 |
| 3 | 2  | 3 | 2 | 1.000000 | 1.000000 | 5 | 3  | 3 | 3 | 1.000000 | 0.100000 |
| 4 | 1  | 1 | 0 | 0.750000 | 0.750000 | 5 | 3  | 4 | 2 | 0.600000 | 0.600000 |
| 4 | 1  | 1 | 1 | 1.000000 | 0.250000 | 5 | 3  | 4 | 3 | 1.000000 | 0.400000 |
| 4 | 1  | 2 | 0 | 0.500000 | 0.500000 | 5 | 3  | 5 | 3 | 1.000000 | 1.000000 |
| 4 | 1  | 2 | 1 | 1.000000 | 0.500000 | 5 | 4  | 1 | 0 | 0.200000 | 0.200000 |
| 4 | 1  | 3 | 0 | 0.250000 | 0.250000 | 5 | 4  | 1 | 1 | 1.000000 | 0.800000 |
| 4 | 1  | 3 | 1 | 1.000000 | 0.750000 | 5 | 4  | 2 | 1 | 0.400000 | 0.400000 |
| 4 | 1  | 4 | 1 | 1.000000 | 1.000000 | 5 | 4  | 2 | 2 | 1.000000 | 0.600000 |
| 4 | 2  | 1 | 0 | 0.500000 | 0.500000 | 5 | 4  | 3 | 2 | 0.600000 | 0.600000 |
| 4 | 2  | 1 | 1 | 1.000000 | 0.500000 | 5 | 4  | 3 | 3 | 1.000000 | 0.400000 |
| 4 | 2  | 2 | 0 | 0.166667 | 0.166667 | 5 | 4  | 4 | 3 | 0.800000 | 0.800000 |
| 4 | 2  | 2 | 1 | 0.833333 | 0.666667 | 5 | 4  | 4 | 4 | 1.000000 | 0.200000 |
| 4 | 2  | 2 | 2 | 1.000000 | 0.166667 | 5 | 4  | 5 | 4 | 1.000000 | 1.000000 |
| 4 | 2  | 3 | 1 | 0.500000 | 0.500000 | 6 | 1  | 1 | 0 | 0.833333 | 0.833333 |
| 4 | 2  | 3 | 2 | 1.000000 | 0.500000 | 6 | 1  | 1 | 1 | 1.000000 | 0.166667 |
| 4 | 2  | 4 | 2 | 1.000000 | 1.000000 | 6 | 1  | 2 | 0 | 0.666667 | 0.666667 |
| 4 | 3  | 1 | 0 | 0.250000 | 0.250000 | 6 | 1  | 2 | 1 | 1.000000 | 0.333333 |
| 4 | 3  | 1 | 1 | 1.000000 | 0.750000 | 6 | 1  | 3 | 0 | 0.500000 | 0.500000 |
| 4 | 3  | 2 | 1 | 0.500000 | 0.500000 | 6 | 1  | 3 | 1 | 1.000000 | 0.500000 |
| 4 | 3  | 2 | 2 | 1.000000 | 0.500000 | 6 | 1  | 4 | 0 | 0.333333 | 0.333333 |
| 4 | 3  | 3 | 2 | 0.750000 | 0.750000 | 6 | 1  | 4 | 1 | 1.000000 | 0.666667 |
| 4 | 3  | 3 | 3 | 1.000000 | 0.250000 | 6 | 1  | 5 | 0 | 0.166667 | 0.166667 |
| 4 | 3  | 4 | 3 | 1.000000 | 1.000000 | 6 | 1  | 5 | 1 | 1.000000 | 0.833333 |
| 5 | 1  | 1 | 0 | 0.800000 | 0.800000 | 6 | 1  | 6 | 1 | 1.000000 | 1.000000 |
| 5 | 1  | 1 | 1 | 1.000000 | 0.200000 | 6 | 2  | 1 | 0 | 0.666667 | 0.666667 |
| 5 | 1  | 2 | 0 | 0.600000 | 0.600000 | 6 | 2  | 1 | 1 | 1.000000 | 0.333333 |
| 5 | 1  | 2 | 1 | 1.000000 | 0.400000 | 6 | 2  | 2 | 0 | 0.400000 | 0.400000 |
| 5 | 1  | 3 | 0 | 0.400000 | 0.400000 | 6 | 2  | 2 | 1 | 0.933333 | 0.533333 |
| 5 | 1  | 3 | 1 | 1.000000 | 0.600000 | 6 | 2  | 2 | 2 | 1.000000 | 0.066667 |
| 5 | 1  | 4 | 0 | 0.200000 | 0.200000 | 6 | 2  | 3 | 0 | 0.200000 | 0.200000 |
| 5 | 1  | 4 | 1 | 1.000000 | 0.800000 | 6 | 2  | 3 | 1 | 0.800000 | 0.600000 |
| 5 | 1  | 5 | 1 | 1.000000 | 1.000000 | 6 | 2  | 3 | 2 | 1.000000 | 0.200000 |
| 5 | 2  | 1 | 0 | 0.600000 | 0.600000 | 6 | 2  | 4 | 0 | 0.066667 | 0.066667 |
| 5 | 2  | 1 | 1 | 1.000000 | 0.400000 | 6 | 2  | 4 | 1 | 0.600000 | 0.533333 |
| 5 | 2  | 2 | 0 | 0.300000 | 0.300000 | 6 | 2  | 4 | 2 | 1.000000 | 0.400000 |
| 5 | 2  | 2 | 1 | 0.900000 | 0.600000 | 6 | 2  | 5 | 1 | 0.333333 | 0.333333 |
| 5 | 2  | 2 | 2 | 1.000000 | 0.100000 | 6 | 2  | 5 | 2 | 1.000000 | 0.666667 |
| 5 | 2  | 3 | 0 | 0.100000 | 0.100000 | 6 | 2  | 6 | 2 | 1.000000 | 1.000000 |

| N | NS | K | X | P(<=X)   | P(=X)    | N | NS | K | X | P(<=X)   | P(=X)    |
|---|----|---|---|----------|----------|---|----|---|---|----------|----------|
| 6 | 3  | 1 | 0 | 0.500000 | 0.500000 | 7 | 1  | 6 | 0 | 0.142857 | 0.142857 |
| 6 | 3  | 1 | 1 | 1.000000 | 0.500000 | 7 | 1  | 6 | 1 | 1.000000 | 0.857143 |
| 6 | 3  | 2 | 0 | 0.200000 | 0.200000 | 7 | 1  | 7 | 1 | 1.000000 | 1.000000 |
| 6 | 3  | 2 | 1 | 0.800000 | 0.600000 | 7 | 2  | 1 | 0 | 0.714286 | 0.714286 |
| 6 | 3  | 2 | 2 | 1.000000 | 0.200000 | 7 | 2  | 1 | 1 | 1.000000 | 0.285714 |
| 6 | 3  | 3 | 0 | 0.050000 | 0.050000 | 7 | 2  | 2 | 0 | 0.476190 | 0.476190 |
| 6 | 3  | 3 | 1 | 0.500000 | 0.450000 | 7 | 2  | 2 | 1 | 0.952381 | 0.476190 |
| 6 | 3  | 3 | 2 | 0.950000 | 0.450000 | 7 | 2  | 2 | 2 | 1.000000 | 0.047619 |
| 6 | 3  | 3 | 3 | 1.000000 | 0.050000 | 7 | 2  | 3 | 0 | 0.285714 | 0.285714 |
| 6 | 3  | 4 | 1 | 0.200000 | 0.200000 | 7 | 2  | 3 | 1 | 0.857143 | 0.571429 |
| 6 | 3  | 4 | 2 | 0.800000 | 0.600000 | 7 | 2  | 3 | 2 | 1.000000 | 0.142857 |
| 6 | 3  | 4 | 3 | 1.000000 | 0.200000 | 7 | 2  | 4 | 0 | 0.142857 | 0.142857 |
| 6 | 3  | 5 | 2 | 0.500000 | 0.500000 | 7 | 2  | 4 | 1 | 0.714286 | 0.571429 |
| 6 | 3  | 5 | 3 | 1.000000 | 0.500000 | 7 | 2  | 4 | 2 | 1.000000 | 0.285714 |
| 6 | 3  | 6 | 3 | 1.000000 | 1.000000 | 7 | 2  | 5 | 0 | 0.047619 | 0.047619 |
| 6 | 4  | 1 | 0 | 0.333333 | 0.333333 | 7 | 2  | 5 | 1 | 0.523810 | 0.476190 |
| 6 | 4  | 1 | 1 | 1.000000 | 0.666667 | 7 | 2  | 5 | 2 | 1.000000 | 0.476190 |
| 6 | 4  | 2 | 0 | 0.066667 | 0.066667 | 7 | 2  | 6 | 1 | 0.285714 | 0.285714 |
| 6 | 4  | 2 | 1 | 0.600000 | 0.533333 | 7 | 2  | 6 | 2 | 1.000000 | 0.714286 |
| 6 | 4  | 2 | 2 | 1.000000 | 0.400000 | 7 | 2  | 7 | 2 | 1.000000 | 1.000000 |
| 6 | 4  | 3 | 1 | 0.200000 | 0.200000 | 7 | 3  | 1 | 0 | 0.571429 | 0.571429 |
| 6 | 4  | 3 | 2 | 0.800000 | 0.600000 | 7 | 3  | 1 | 1 | 1.000000 | 0.428571 |
| 6 | 4  | 3 | 3 | 1.000000 | 0.200000 | 7 | 3  | 2 | 0 | 0.285714 | 0.285714 |
| 6 | 4  | 4 | 2 | 0.400000 | 0.400000 | 7 | 3  | 2 | 1 | 0.857143 | 0.571429 |
| 6 | 4  | 4 | 3 | 0.933333 | 0.533333 | 7 | 3  | 2 | 2 | 1.000000 | 0.142857 |
| 6 | 4  | 4 | 4 | 1.000000 | 0.066667 | 7 | 3  | 3 | 0 | 0.114286 | 0.114286 |
| 6 | 4  | 5 | 3 | 0.666667 | 0.666667 | 7 | 3  | 3 | 1 | 0.628571 | 0.514286 |
| 6 | 4  | 5 | 4 | 1.000000 | 0.333333 | 7 | 3  | 3 | 2 | 0.971429 | 0.342857 |
| 6 | 4  | 6 | 4 | 1.000000 | 1.000000 | 7 | 3  | 3 | 3 | 1.000000 | 0.028571 |
| 6 | 5  | 1 | 0 | 0.166667 | 0.166667 | 7 | 3  | 4 | 0 | 0.028571 | 0.028571 |
| 6 | 5  | 1 | 1 | 1.000000 | 0.833333 | 7 | 3  | 4 | 1 | 0.371429 | 0.342857 |
| 6 | 5  | 2 | 1 | 0.333333 | 0.333333 | 7 | 3  | 4 | 2 | 0.885714 | 0.514286 |
| 6 | 5  | 2 | 2 | 1.000000 | 0.666667 | 7 | 3  | 4 | 3 | 1.000000 | 0.114286 |
| 6 | 5  | 3 | 2 | 0.500000 | 0.500000 | 7 | 3  | 5 | 1 | 0.142857 | 0.142857 |
| 6 | 5  | 3 | 3 | 1.000000 | 0.500000 | 7 | 3  | 5 | 2 | 0.714286 | 0.571429 |
| 6 | 5  | 4 | 3 | 0.666667 | 0.666667 | 7 | 3  | 5 | 3 | 1.000000 | 0.285714 |
| 6 | 5  | 4 | 4 | 1.000000 | 0.333333 | 7 | 3  | 6 | 2 | 0.428571 | 0.428571 |
| 6 | 5  | 5 | 4 | 0.833333 | 0.833333 | 7 | 3  | 6 | 3 | 1.000000 | 0.571429 |
| 6 | 5  | 5 | 5 | 1.000000 | 0.166667 | 7 | 3  | 7 | 3 | 1.000000 | 1.000000 |
| 6 | 5  | 6 | 5 | 1.000000 | 1.000000 | 7 | 4  | 1 | 0 | 0.428571 | 0.428571 |
| 7 | 1  | 1 | 0 | 0.857143 | 0.857143 | 7 | 4  | 1 | 1 | 1.000000 | 0.571429 |
| 7 | 1  | 1 | 1 | 1.000000 | 0.142857 | 7 | 4  | 2 | 0 | 0.142857 | 0.142857 |
| 7 | 1  | 2 | 0 | 0.714286 | 0.714286 | 7 | 4  | 2 | 1 | 0.714286 | 0.571429 |
| 7 | 1  | 2 | 1 | 1.000000 | 0.285714 | 7 | 4  | 2 | 2 | 1.000000 | 0.285714 |
| 7 | 1  | 3 | 0 | 0.571429 | 0.571429 | 7 | 4  | 3 | 0 | 0.028571 | 0.028571 |
| 7 | 1  | 3 | 1 | 1.000000 | 0.428571 | 7 | 4  | 3 | 1 | 0.371429 | 0.342857 |
| 7 | 1  | 4 | 0 | 0.428571 | 0.428571 | 7 | 4  | 3 | 2 | 0.885714 | 0.514286 |
| 7 | 1  | 4 | 1 | 1.000000 | 0.571429 | 7 | 4  | 3 | 3 | 1.000000 | 0.114286 |
| 7 | 1  | 5 | 0 | 0.285714 | 0.285714 | 7 | 4  | 4 | 1 | 0.114286 | 0.114286 |
| 7 | 1  | 5 | 1 | 1.000000 | 0.714286 | 7 | 4  | 4 | 2 | 0.628571 | 0.514286 |

| N | NS | K | X | P(<=X)   | P(=X)    |
|---|----|---|---|----------|----------|
| 7 | 4  | 4 | 3 | 0.971429 | 0.342857 |
| 7 | 4  | 4 | 4 | 1.000000 | 0.028571 |
| 7 | 4  | 5 | 2 | 0.285714 | 0.285714 |
| 7 | 4  | 5 | 3 | 0.857143 | 0.571429 |
| 7 | 4  | 5 | 4 | 1.000000 | 0.142857 |
| 7 | 4  | 6 | 3 | 0.571429 | 0.571429 |
| 7 | 4  | 6 | 4 | 1.000000 | 0.428571 |
| 7 | 4  | 7 | 4 | 1.000000 | 1.000000 |
| 7 | 5  | 1 | 0 | 0.285714 | 0.285714 |
| 7 | 5  | 1 | 1 | 1.000000 | 0.714286 |
| 7 | 5  | 2 | 0 | 0.047619 | 0.047619 |
| 7 | 5  | 2 | 1 | 0.523810 | 0.476190 |
| 7 | 5  | 2 | 2 | 1.000000 | 0.476190 |
| 7 | 5  | 3 | 1 | 0.142857 | 0.142857 |
| 7 | 5  | 3 | 2 | 0.714286 | 0.571429 |
| 7 | 5  | 3 | 3 | 1.000000 | 0.285714 |
| 7 | 5  | 4 | 2 | 0.285714 | 0.285714 |
| 7 | 5  | 4 | 3 | 0.857143 | 0.571429 |
| 7 | 5  | 4 | 4 | 1.000000 | 0.142857 |
| 7 | 5  | 5 | 3 | 0.476190 | 0.476190 |
| 7 | 5  | 5 | 4 | 0.952381 | 0.476190 |
| 7 | 5  | 5 | 5 | 1.000000 | 0.047619 |
| 7 | 5  | 6 | 4 | 0.714286 | 0.714286 |
| 7 | 5  | 6 | 5 | 1.000000 | 0.285714 |
| 7 | 5  | 7 | 5 | 1.000000 | 1.000000 |
| 7 | 6  | 1 | 0 | 0.142857 | 0.142857 |
| 7 | 6  | 1 | 1 | 1.000000 | 0.857143 |
| 7 | 6  | 2 | 1 | 0.285714 | 0.285714 |
| 7 | 6  | 2 | 2 | 1.000000 | 0.714286 |
| 7 | 6  | 3 | 2 | 0.428571 | 0.428571 |
| 7 | 6  | 3 | 3 | 1.000000 | 0.571429 |
| 7 | 6  | 4 | 3 | 0.571429 | 0.571429 |
| 7 | 6  | 4 | 4 | 1.000000 | 0.428571 |
| 7 | 6  | 5 | 4 | 0.714286 | 0.714286 |
| 7 | 6  | 5 | 5 | 1.000000 | 0.285714 |
| 7 | 6  | 6 | 5 | 0.857143 | 0.857143 |
| 7 | 6  | 6 | 6 | 1.000000 | 0.142857 |
| 7 | 6  | 7 | 6 | 1.000000 | 1.000000 |
| 8 | 1  | 1 | 0 | 0.875000 | 0.875000 |
| 8 | 1  | 1 | 1 | 1.000000 | 0.125000 |
| 8 | 1  | 2 | 0 | 0.750000 | 0.750000 |
| 8 | 1  | 2 | 1 | 1.000000 | 0.250000 |
| 8 | 1  | 3 | 0 | 0.625000 | 0.625000 |
| 8 | 1  | 3 | 1 | 1.000000 | 0.375000 |
| 8 | 1  | 4 | 0 | 0.500000 | 0.500000 |
| 8 | 1  | 4 | 1 | 1.000000 | 0.500000 |
| 8 | 1  | 5 | 0 | 0.375000 | 0.375000 |
| 8 | 1  | 5 | 1 | 1.000000 | 0.625000 |
| 8 | 1  | 6 | 0 | 0.250000 | 0.250000 |
| 8 | 1  | 6 | 1 | 1.000000 | 0.750000 |

| N | NS | K | X | P(<=X)   | P(=X)    |
|---|----|---|---|----------|----------|
| 8 | 1  | 7 | 0 | 0.125000 | 0.125000 |
| 8 | 1  | 7 | 1 | 1.000000 | 0.875000 |
| 8 | 1  | 8 | 1 | 1.000000 | 1.000000 |
| 8 | 2  | 1 | 0 | 0.750000 | 0.750000 |
| 8 | 2  | 1 | 1 | 1.000000 | 0.250000 |
| 8 | 2  | 2 | 0 | 0.535714 | 0.535714 |
| 8 | 2  | 2 | 1 | 0.964286 | 0.428571 |
| 8 | 2  | 2 | 2 | 1.000000 | 0.035714 |
| 8 | 2  | 3 | 0 | 0.357143 | 0.357143 |
| 8 | 2  | 3 | 1 | 0.892857 | 0.535714 |
| 8 | 2  | 3 | 2 | 1.000000 | 0.107143 |
| 8 | 2  | 4 | 0 | 0.214286 | 0.214286 |
| 8 | 2  | 4 | 1 | 0.785714 | 0.571429 |
| 8 | 2  | 4 | 2 | 1.000000 | 0.214286 |
| 8 | 2  | 5 | 0 | 0.107143 | 0.107143 |
| 8 | 2  | 5 | 1 | 0.642857 | 0.535714 |
| 8 | 2  | 5 | 2 | 1.000000 | 0.357143 |
| 8 | 2  | 6 | 0 | 0.035714 | 0.035714 |
| 8 | 2  | 6 | 1 | 0.464286 | 0.428571 |
| 8 | 2  | 6 | 2 | 1.000000 | 0.535714 |
| 8 | 2  | 7 | 1 | 0.250000 | 0.250000 |
| 8 | 2  | 7 | 2 | 1.000000 | 0.750000 |
| 8 | 2  | 8 | 2 | 1.000000 | 1.000000 |
| 8 | 3  | 1 | 0 | 0.625000 | 0.625000 |
| 8 | 3  | 1 | 1 | 1.000000 | 0.375000 |
| 8 | 3  | 2 | 0 | 0.357143 | 0.357143 |
| 8 | 3  | 2 | 1 | 0.892857 | 0.535714 |
| 8 | 3  | 2 | 2 | 1.000000 | 0.107143 |
| 8 | 3  | 3 | 0 | 0.178571 | 0.178571 |
| 8 | 3  | 3 | 1 | 0.714286 | 0.535714 |
| 8 | 3  | 3 | 2 | 0.982143 | 0.267857 |
| 8 | 3  | 3 | 3 | 1.000000 | 0.017857 |
| 8 | 3  | 4 | 0 | 0.071429 | 0.071429 |
| 8 | 3  | 4 | 1 | 0.500000 | 0.428571 |
| 8 | 3  | 4 | 2 | 0.928571 | 0.428571 |
| 8 | 3  | 4 | 3 | 1.000000 | 0.071429 |
| 8 | 3  | 5 | 0 | 0.017857 | 0.017857 |
| 8 | 3  | 5 | 1 | 0.285714 | 0.267857 |
| 8 | 3  | 5 | 2 | 0.821429 | 0.535714 |
| 8 | 3  | 5 | 3 | 1.000000 | 0.178571 |
| 8 | 3  | 6 | 1 | 0.107143 | 0.107143 |
| 8 | 3  | 6 | 2 | 0.642857 | 0.535714 |
| 8 | 3  | 6 | 3 | 1.000000 | 0.357143 |
| 8 | 3  | 7 | 2 | 0.375000 | 0.375000 |
| 8 | 3  | 7 | 3 | 1.000000 | 0.625000 |
| 8 | 3  | 8 | 3 | 1.000000 | 1.000000 |
| 8 | 4  | 1 | 0 | 0.500000 | 0.500000 |
| 8 | 4  | 1 | 1 | 1.000000 | 0.500000 |
| 8 | 4  | 2 | 0 | 0.214286 | 0.214286 |
| 8 | 4  | 2 | 1 | 0.785714 | 0.571429 |

| N | NS | K | X | P(<=X)   | P(=X)    | N | NS | K | X | P(<=X)   | P(=X)    |
|---|----|---|---|----------|----------|---|----|---|---|----------|----------|
| 8 | 4  | 2 | 2 | 1.000000 | 0.214286 | 8 | 6  | 3 | 3 | 1.000000 | 0.357143 |
| 8 | 4  | 3 | 0 | 0.071429 | 0.071429 | 8 | 6  | 4 | 2 | 0.214286 | 0.214286 |
| 8 | 4  | 3 | 1 | 0.500000 | 0.428571 | 8 | 6  | 4 | 3 | 0.785714 | 0.571429 |
| 8 | 4  | 3 | 2 | 0.928571 | 0.428571 | 8 | 6  | 4 | 4 | 1.000000 | 0.214286 |
| 8 | 4  | 3 | 3 | 1.000000 | 0.071429 | 8 | 6  | 5 | 3 | 0.357143 | 0.357143 |
| 8 | 4  | 4 | 0 | 0.014286 | 0.014286 | 8 | 6  | 5 | 4 | 0.892857 | 0.535714 |
| 8 | 4  | 4 | 1 | 0.242857 | 0.228571 | 8 | 6  | 5 | 5 | 1.000000 | 0.107143 |
| 8 | 4  | 4 | 2 | 0.757143 | 0.514286 | 8 | 6  | 6 | 4 | 0.535714 | 0.535714 |
| 8 | 4  | 4 | 3 | 0.985714 | 0.228571 | 8 | 6  | 6 | 5 | 0.964286 | 0.428571 |
| 8 | 4  | 4 | 4 | 1.000000 | 0.014286 | 8 | 6  | 6 | 6 | 1.000000 | 0.035714 |
| 8 | 4  | 5 | 1 | 0.071429 | 0.071429 | 8 | 6  | 7 | 5 | 0.750000 | 0.750000 |
| 8 | 4  | 5 | 2 | 0.500000 | 0.428571 | 8 | 6  | 7 | 6 | 1.000000 | 0.250000 |
| 8 | 4  | 5 | 3 | 0.928571 | 0.428571 | 8 | 6  | 8 | 6 | 1.000000 | 1.000000 |
| 8 | 4  | 5 | 4 | 1.000000 | 0.071429 | 8 | 7  | 1 | 0 | 0.125000 | 0.125000 |
| 8 | 4  | 6 | 2 | 0.214286 | 0.214286 | 8 | 7  | 1 | 1 | 1.000000 | 0.875000 |
| 8 | 4  | 6 | 3 | 0.785714 | 0.571429 | 8 | 7  | 2 | 1 | 0.250000 | 0.250000 |
| 8 | 4  | 6 | 4 | 1.000000 | 0.214286 | 8 | 7  | 2 | 2 | 1.000000 | 0.750000 |
| 8 | 4  | 7 | 3 | 0.500000 | 0.500000 | 8 | 7  | 3 | 2 | 0.375000 | 0.375000 |
| 8 | 4  | 7 | 4 | 1.000000 | 0.500000 | 8 | 7  | 3 | 3 | 1.000000 | 0.625000 |
| 8 | 4  | 8 | 4 | 1.000000 | 1.000000 | 8 | 7  | 4 | 3 | 0.500000 | 0.500000 |
| 8 | 5  | 1 | 0 | 0.375000 | 0.375000 | 8 | 7  | 4 | 4 | 1.000000 | 0.500000 |
| 8 | 5  | 1 | 1 | 1.000000 | 0.625000 | 8 | 7  | 5 | 4 | 0.625000 | 0.625000 |
| 8 | 5  | 2 | 0 | 0.107143 | 0.107143 | 8 | 7  | 5 | 5 | 1.000000 | 0.375000 |
| 8 | 5  | 2 | 1 | 0.642857 | 0.535714 | 8 | 7  | 6 | 5 | 0.750000 | 0.750000 |
| 8 | 5  | 2 | 2 | 1.000000 | 0.357143 | 8 | 7  | 6 | 6 | 1.000000 | 0.250000 |
| 8 | 5  | 3 | 0 | 0.017857 | 0.017857 | 8 | 7  | 7 | 6 | 0.875000 | 0.875000 |
| 8 | 5  | 3 | 1 | 0.285714 | 0.267857 | 8 | 7  | 7 | 7 | 1.000000 | 0.125000 |
| 8 | 5  | 3 | 2 | 0.821429 | 0.535714 | 8 | 7  | 8 | 7 | 1.000000 | 1.000000 |
| 8 | 5  | 3 | 3 | 1.000000 | 0.178571 | 9 | 1  | 1 | 0 | 0.888889 | 0.888889 |
| 8 | 5  | 4 | 1 | 0.071429 | 0.071429 | 9 | 1  | 1 | 1 | 1.000000 | 0.111111 |
| 8 | 5  | 4 | 2 | 0.500000 | 0.428571 | 9 | 1  | 2 | 0 | 0.777778 | 0.777778 |
| 8 | 5  | 4 | 3 | 0.928571 | 0.428571 | 9 | 1  | 2 | 1 | 1.000000 | 0.222222 |
| 8 | 5  | 4 | 4 | 1.000000 | 0.071429 | 9 | 1  | 3 | 0 | 0.666667 | 0.666667 |
| 8 | 5  | 5 | 2 | 0.178571 | 0.178571 | 9 | 1  | 3 | 1 | 1.000000 | 0.333333 |
| 8 | 5  | 5 | 3 | 0.714286 | 0.535714 | 9 | 1  | 4 | 0 | 0.555556 | 0.555556 |
| 8 | 5  | 5 | 4 | 0.982143 | 0.267857 | 9 | 1  | 4 | 1 | 1.000000 | 0.444444 |
| 8 | 5  | 5 | 5 | 1.000000 | 0.017857 | 9 | 1  | 5 | 0 | 0.444444 | 0.444444 |
| 8 | 5  | 6 | 3 | 0.357143 | 0.357143 | 9 | 1  | 5 | 1 | 1.000000 | 0.555556 |
| 8 | 5  | 6 | 4 | 0.892857 | 0.535714 | 9 | 1  | 6 | 0 | 0.333333 | 0.333333 |
| 8 | 5  | 6 | 5 | 1.000000 | 0.107143 | 9 | 1  | 6 | 1 | 1.000000 | 0.666667 |
| 8 | 5  | 7 | 4 | 0.625000 | 0.625000 | 9 | 1  | 7 | 0 | 0.222222 | 0.222222 |
| 8 | 5  | 7 | 5 | 1.000000 | 0.375000 | 9 | 1  | 7 | 1 | 1.000000 | 0.777778 |
| 8 | 5  | 8 | 5 | 1.000000 | 1.000000 | 9 | 1  | 8 | 0 | 0.111111 | 0.111111 |
| 8 | 6  | 1 | 0 | 0.250000 | 0.250000 | 9 | 1  | 8 | 1 | 1.000000 | 0.888889 |
| 8 | 6  | 1 | 1 | 1.000000 | 0.750000 | 9 | 1  | 9 | 1 | 1.000000 | 1.000000 |
| 8 | 6  | 2 | 0 | 0.035714 | 0.035714 | 9 | 2  | 1 | 0 | 0.777778 | 0.777778 |
| 8 | 6  | 2 | 1 | 0.464286 | 0.428571 | 9 | 2  | 1 | 1 | 1.000000 | 0.222222 |
| 8 | 6  | 2 | 2 | 1.000000 | 0.535714 | 9 | 2  | 2 | 0 | 0.583333 | 0.583333 |
| 8 | 6  | 3 | 1 | 0.107143 | 0.107143 | 9 | 2  | 2 | 1 | 0.972222 | 0.388889 |
| 8 | 6  | 3 | 2 | 0.642857 | 0.535714 | 9 | 2  | 2 | 2 | 1.000000 | 0.027778 |

| N | NS | K | X | P(<=X)   | P(=X)    |
|---|----|---|---|----------|----------|
| 9 | 2  | 3 | 0 | 0.416667 | 0.416667 |
| 9 | 2  | 3 | 1 | 0.916667 | 0.500000 |
| 9 | 2  | 3 | 2 | 1.000000 | 0.083333 |
| 9 | 2  | 4 | 0 | 0.277778 | 0.277778 |
| 9 | 2  | 4 | 1 | 0.833333 | 0.555556 |
| 9 | 2  | 4 | 2 | 1.000000 | 0.166667 |
| 9 | 2  | 5 | 0 | 0.166667 | 0.166667 |
| 9 | 2  | 5 | 1 | 0.722222 | 0.555556 |
| 9 | 2  | 5 | 2 | 1.000000 | 0.277778 |
| 9 | 2  | 6 | 0 | 0.083333 | 0.083333 |
| 9 | 2  | 6 | 1 | 0.583333 | 0.500000 |
| 9 | 2  | 6 | 2 | 1.000000 | 0.416667 |
| 9 | 2  | 7 | 0 | 0.027778 | 0.027778 |
| 9 | 2  | 7 | 1 | 0.416667 | 0.388889 |
| 9 | 2  | 7 | 2 | 1.000000 | 0.583333 |
| 9 | 2  | 8 | 1 | 0.222222 | 0.222222 |
| 9 | 2  | 8 | 2 | 1.000000 | 0.777778 |
| 9 | 2  | 9 | 2 | 1.000000 | 1.000000 |
| 9 | 3  | 1 | 0 | 0.666667 | 0.666667 |
| 9 | 3  | 1 | 1 | 1.000000 | 0.333333 |
| 9 | 3  | 2 | 0 | 0.416667 | 0.416667 |
| 9 | 3  | 2 | 1 | 0.916667 | 0.500000 |
| 9 | 3  | 2 | 2 | 1.000000 | 0.083333 |
| 9 | 3  | 3 | 0 | 0.238095 | 0.238095 |
| 9 | 3  | 3 | 1 | 0.773810 | 0.535714 |
| 9 | 3  | 3 | 2 | 0.988095 | 0.214286 |
| 9 | 3  | 3 | 3 | 1.000000 | 0.011905 |
| 9 | 3  | 4 | 0 | 0.119048 | 0.119048 |
| 9 | 3  | 4 | 1 | 0.595238 | 0.476190 |
| 9 | 3  | 4 | 2 | 0.952381 | 0.357143 |
| 9 | 3  | 4 | 3 | 1.000000 | 0.047619 |
| 9 | 3  | 5 | 0 | 0.047619 | 0.047619 |
| 9 | 3  | 5 | 1 | 0.404762 | 0.357143 |
| 9 | 3  | 5 | 2 | 0.880952 | 0.476190 |
| 9 | 3  | 5 | 3 | 1.000000 | 0.119048 |
| 9 | 3  | 6 | 0 | 0.011905 | 0.011905 |
| 9 | 3  | 6 | 1 | 0.226190 | 0.214286 |
| 9 | 3  | 6 | 2 | 0.761905 | 0.535714 |
| 9 | 3  | 6 | 3 | 1.000000 | 0.238095 |
| 9 | 3  | 7 | 1 | 0.083333 | 0.083333 |
| 9 | 3  | 7 | 2 | 0.583333 | 0.500000 |
| 9 | 3  | 7 | 3 | 1.000000 | 0.416667 |
| 9 | 3  | 8 | 2 | 0.333333 | 0.333333 |
| 9 | 3  | 8 | 3 | 1.000000 | 0.666667 |
| 9 | 3  | 9 | 3 | 1.000000 | 1.000000 |
| 9 | 4  | 1 | 0 | 0.555556 | 0.555556 |
| 9 | 4  | 1 | 1 | 1.000000 | 0.444444 |
| 9 | 4  | 2 | 0 | 0.277778 | 0.277778 |
| 9 | 4  | 2 | 1 | 0.833333 | 0.555556 |
| 9 | 4  | 2 | 2 | 1.000000 | 0.166667 |

| N | NS | K | X | P(<=X)   | P(=X)    |
|---|----|---|---|----------|----------|
| 9 | 4  | 3 | 0 | 0.119048 | 0.119048 |
| 9 | 4  | 3 | 1 | 0.595238 | 0.476190 |
| 9 | 4  | 3 | 2 | 0.952381 | 0.357143 |
| 9 | 4  | 3 | 3 | 1.000000 | 0.047619 |
| 9 | 4  | 4 | 0 | 0.039683 | 0.039683 |
| 9 | 4  | 4 | 1 | 0.357143 | 0.317460 |
| 9 | 4  | 4 | 2 | 0.833333 | 0.476190 |
| 9 | 4  | 4 | 3 | 0.992063 | 0.158730 |
| 9 | 4  | 4 | 4 | 1.000000 | 0.007937 |
| 9 | 4  | 5 | 0 | 0.007937 | 0.007937 |
| 9 | 4  | 5 | 1 | 0.166667 | 0.158730 |
| 9 | 4  | 5 | 2 | 0.642857 | 0.476190 |
| 9 | 4  | 5 | 3 | 0.960317 | 0.317460 |
| 9 | 4  | 5 | 4 | 1.000000 | 0.039683 |
| 9 | 4  | 6 | 1 | 0.047619 | 0.047619 |
| 9 | 4  | 6 | 2 | 0.404762 | 0.357143 |
| 9 | 4  | 6 | 3 | 0.880952 | 0.476190 |
| 9 | 4  | 6 | 4 | 1.000000 | 0.119048 |
| 9 | 4  | 7 | 2 | 0.166667 | 0.166667 |
| 9 | 4  | 7 | 3 | 0.722222 | 0.555556 |
| 9 | 4  | 7 | 4 | 1.000000 | 0.277778 |
| 9 | 4  | 8 | 3 | 0.444444 | 0.444444 |
| 9 | 4  | 8 | 4 | 1.000000 | 0.555556 |
| 9 | 4  | 9 | 4 | 1.000000 | 1.000000 |
| 9 | 5  | 1 | 0 | 0.444444 | 0.444444 |
| 9 | 5  | 1 | 1 | 1.000000 | 0.555556 |
| 9 | 5  | 2 | 0 | 0.166667 | 0.166667 |
| 9 | 5  | 2 | 1 | 0.722222 | 0.555556 |
| 9 | 5  | 2 | 2 | 1.000000 | 0.277778 |
| 9 | 5  | 3 | 0 | 0.047619 | 0.047619 |
| 9 | 5  | 3 | 1 | 0.404762 | 0.357143 |
| 9 | 5  | 3 | 2 | 0.880952 | 0.476190 |
| 9 | 5  | 3 | 3 | 1.000000 | 0.119048 |
| 9 | 5  | 4 | 0 | 0.007937 | 0.007937 |
| 9 | 5  | 4 | 1 | 0.166667 | 0.158730 |
| 9 | 5  | 4 | 2 | 0.642857 | 0.476190 |
| 9 | 5  | 4 | 3 | 0.960317 | 0.317460 |
| 9 | 5  | 4 | 4 | 1.000000 | 0.039683 |
| 9 | 5  | 5 | 1 | 0.039683 | 0.039683 |
| 9 | 5  | 5 | 2 | 0.357143 | 0.317460 |
| 9 | 5  | 5 | 3 | 0.833333 | 0.476190 |
| 9 | 5  | 5 | 4 | 0.992063 | 0.158730 |
| 9 | 5  | 5 | 5 | 1.000000 | 0.007937 |
| 9 | 5  | 6 | 2 | 0.119048 | 0.119048 |
| 9 | 5  | 6 | 3 | 0.595238 | 0.476190 |
| 9 | 5  | 6 | 4 | 0.952381 | 0.357143 |
| 9 | 5  | 6 | 5 | 1.000000 | 0.047619 |
| 9 | 5  | 7 | 3 | 0.277778 | 0.277778 |
| 9 | 5  | 7 | 4 | 0.833333 | 0.555556 |
| 9 | 5  | 7 | 5 | 1.000000 | 0.166667 |

| N | NS | K | X | P(<=X)   | P(=X)    | N  | NS | K  | X | P(<=X)   | P(=X)    |
|---|----|---|---|----------|----------|----|----|----|---|----------|----------|
| 9 | 5  | 8 | 4 | 0.555556 | 0.555556 | 9  | 7  | 8  | 6 | 0.777778 | 0.777778 |
| 9 | 5  | 8 | 5 | 1.000000 | 0.444444 | 9  | 7  | 8  | 7 | 1.000000 | 0.222222 |
| 9 | 5  | 9 | 5 | 1.000000 | 1.000000 | 9  | 7  | 9  | 7 | 1.000000 | 1.000000 |
| 9 | 6  | 1 | 0 | 0.333333 | 0.333333 | 9  | 8  | 1  | 0 | 0.111111 | 0.111111 |
| 9 | 6  | 1 | 1 | 1.000000 | 0.666667 | 9  | 8  | 1  | 1 | 1.000000 | 0.888889 |
| 9 | 6  | 2 | 0 | 0.083333 | 0.083333 | 9  | 8  | 2  | 1 | 0.222222 | 0.222222 |
| 9 | 6  | 2 | 1 | 0.583333 | 0.500000 | 9  | 8  | 2  | 2 | 1.000000 | 0.777778 |
| 9 | 6  | 2 | 2 | 1.000000 | 0.416667 | 9  | 8  | 3  | 2 | 0.333333 | 0.333333 |
| 9 | 6  | 3 | 0 | 0.011905 | 0.011905 | 9  | 8  | 3  | 3 | 1.000000 | 0.666667 |
| 9 | 6  | 3 | 1 | 0.226190 | 0.214286 | 9  | 8  | 4  | 3 | 0.444444 | 0.444444 |
| 9 | 6  | 3 | 2 | 0.761905 | 0.535714 | 9  | 8  | 4  | 4 | 1.000000 | 0.555556 |
| 9 | 6  | 3 | 3 | 1.000000 | 0.238095 | 9  | 8  | 5  | 4 | 0.555556 | 0.555556 |
| 9 | 6  | 4 | 1 | 0.047619 | 0.047619 | 9  | 8  | 5  | 5 | 1.000000 | 0.444444 |
| 9 | 6  | 4 | 2 | 0.404762 | 0.357143 | 9  | 8  | 6  | 5 | 0.666667 | 0.666667 |
| 9 | 6  | 4 | 3 | 0.880952 | 0.476190 | 9  | 8  | 6  | 6 | 1.000000 | 0.333333 |
| 9 | 6  | 4 | 4 | 1.000000 | 0.119048 | 9  | 8  | 7  | 6 | 0.777778 | 0.777778 |
| 9 | 6  | 5 | 2 | 0.119048 | 0.119048 | 9  | 8  | 7  | 7 | 1.000000 | 0.222222 |
| 9 | 6  | 5 | 3 | 0.595238 | 0.476190 | 9  | 8  | 8  | 7 | 0.888889 | 0.888889 |
| 9 | 6  | 5 | 4 | 0.952381 | 0.357143 | 9  | 8  | 8  | 8 | 1.000000 | 0.111111 |
| 9 | 6  | 5 | 5 | 1.000000 | 0.047619 | 9  | 8  | 9  | 8 | 1.000000 | 1.000000 |
| 9 | 6  | 6 | 3 | 0.238095 | 0.238095 | 10 | 1  | 1  | 0 | 0.900000 | 0.900000 |
| 9 | 6  | 6 | 4 | 0.773810 | 0.535714 | 10 | 1  | 1  | 1 | 1.000000 | 0.100000 |
| 9 | 6  | 6 | 5 | 0.988095 | 0.214286 | 10 | 1  | 2  | 0 | 0.800000 | 0.800000 |
| 9 | 6  | 6 | 6 | 1.000000 | 0.011905 | 10 | 1  | 2  | 1 | 1.000000 | 0.200000 |
| 9 | 6  | 7 | 4 | 0.416667 | 0.416667 | 10 | 1  | 3  | 0 | 0.700000 | 0.700000 |
| 9 | 6  | 7 | 5 | 0.916667 | 0.500000 | 10 | 1  | 3  | 1 | 1.000000 | 0.300000 |
| 9 | 6  | 7 | 6 | 1.000000 | 0.083333 | 10 | 1  | 4  | 0 | 0.600000 | 0.600000 |
| 9 | 6  | 8 | 5 | 0.666667 | 0.666667 | 10 | 1  | 4  | 1 | 1.000000 | 0.400000 |
| 9 | 6  | 8 | 6 | 1.000000 | 0.333333 | 10 | 1  | 5  | 0 | 0.500000 | 0.500000 |
| 9 | 6  | 9 | 6 | 1.000000 | 1.000000 | 10 | 1  | 5  | 1 | 1.000000 | 0.500000 |
| 9 | 7  | 1 | 0 | 0.222222 | 0.222222 | 10 | 1  | 6  | 0 | 0.400000 | 0.400000 |
| 9 | 7  | 1 | 1 | 1.000000 | 0.777778 | 10 | 1  | 6  | 1 | 1.000000 | 0.600000 |
| 9 | 7  | 2 | 0 | 0.027778 | 0.027778 | 10 | 1  | 7  | 0 | 0.300000 | 0.300000 |
| 9 | 7  | 2 | 1 | 0.416667 | 0.388889 | 10 | 1  | 7  | 1 | 1.000000 | 0.700000 |
| 9 | 7  | 2 | 2 | 1.000000 | 0.583333 | 10 | 1  | 8  | 0 | 0.200000 | 0.200000 |
| 9 | 7  | 3 | 1 | 0.083333 | 0.083333 | 10 | 1  | 8  | 1 | 1.000000 | 0.800000 |
| 9 | 7  | 3 | 2 | 0.583333 | 0.500000 | 10 | 1  | 9  | 0 | 0.100000 | 0.100000 |
| 9 | 7  | 3 | 3 | 1.000000 | 0.416667 | 10 | 1  | 9  | 1 | 1.000000 | 0.900000 |
| 9 | 7  | 4 | 2 | 0.166667 | 0.166667 | 10 | 1  | 10 | 1 | 1.000000 | 1.000000 |
| 9 | 7  | 4 | 3 | 0.722222 | 0.555556 | 10 | 2  | 1  | 0 | 0.800000 | 0.800000 |
| 9 | 7  | 4 | 4 | 1.000000 | 0.277778 | 10 | 2  | 1  | 1 | 1.000000 | 0.200000 |
| 9 | 7  | 5 | 3 | 0.277778 | 0.277778 | 10 | 2  | 2  | 0 | 0.622222 | 0.622222 |
| 9 | 7  | 5 | 4 | 0.833333 | 0.555556 | 10 | 2  | 2  | 1 | 0.977778 | 0.355556 |
| 9 | 7  | 5 | 5 | 1.000000 | 0.166667 | 10 | 2  | 2  | 2 | 1.000000 | 0.022222 |
| 9 | 7  | 6 | 4 | 0.416667 | 0.416667 | 10 | 2  | 3  | 0 | 0.466667 | 0.466667 |
| 9 | 7  | 6 | 5 | 0.916667 | 0.500000 | 10 | 2  | 3  | 1 | 0.933333 | 0.466667 |
| 9 | 7  | 6 | 6 | 1.000000 | 0.083333 | 10 | 2  | 3  | 2 | 1.000000 | 0.066667 |
| 9 | 7  | 7 | 5 | 0.583333 | 0.583333 | 10 | 2  | 4  | 0 | 0.333333 | 0.333333 |
| 9 | 7  | 7 | 6 | 0.972222 | 0.388889 | 10 | 2  | 4  | 1 | 0.866667 | 0.533333 |
| 9 | 7  | 7 | 7 | 1.000000 | 0.027778 | 10 | 2  | 4  | 2 | 1.000000 | 0.133333 |

| N  | NS | K  | X | P(<=X)   | P(=X)    | N  | NS | K  | X | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|----|----|----|---|----------|----------|
| 10 | 2  | 5  | 0 | 0.222222 | 0.222222 | 10 | 4  | 2  | 2 | 1.000000 | 0.133333 |
| 10 | 2  | 5  | 1 | 0.777778 | 0.555556 | 10 | 4  | 3  | 0 | 0.166667 | 0.166667 |
| 10 | 2  | 5  | 2 | 1.000000 | 0.222222 | 10 | 4  | 3  | 1 | 0.666667 | 0.500000 |
| 10 | 2  | 6  | 0 | 0.133333 | 0.133333 | 10 | 4  | 3  | 2 | 0.966667 | 0.300000 |
| 10 | 2  | 6  | 1 | 0.666667 | 0.533333 | 10 | 4  | 3  | 3 | 1.000000 | 0.033333 |
| 10 | 2  | 6  | 2 | 1.000000 | 0.333333 | 10 | 4  | 4  | 0 | 0.071429 | 0.071429 |
| 10 | 2  | 7  | 0 | 0.066667 | 0.066667 | 10 | 4  | 4  | 1 | 0.452381 | 0.380952 |
| 10 | 2  | 7  | 1 | 0.533333 | 0.466667 | 10 | 4  | 4  | 2 | 0.880952 | 0.428571 |
| 10 | 2  | 7  | 2 | 1.000000 | 0.466667 | 10 | 4  | 4  | 3 | 0.995238 | 0.114286 |
| 10 | 2  | 8  | 0 | 0.022222 | 0.022222 | 10 | 4  | 4  | 4 | 1.000000 | 0.004762 |
| 10 | 2  | 8  | 1 | 0.377778 | 0.355556 | 10 | 4  | 5  | 0 | 0.023810 | 0.023810 |
| 10 | 2  | 8  | 2 | 1.000000 | 0.622222 | 10 | 4  | 5  | 1 | 0.261905 | 0.238095 |
| 10 | 2  | 9  | 1 | 0.200000 | 0.200000 | 10 | 4  | 5  | 2 | 0.738095 | 0.476190 |
| 10 | 2  | 9  | 2 | 1.000000 | 0.800000 | 10 | 4  | 5  | 3 | 0.976190 | 0.238095 |
| 10 | 2  | 10 | 2 | 1.000000 | 1.000000 | 10 | 4  | 5  | 4 | 1.000000 | 0.023810 |
| 10 | 3  | 1  | 0 | 0.700000 | 0.700000 | 10 | 4  | 6  | 0 | 0.004762 | 0.004762 |
| 10 | 3  | 1  | 1 | 1.000000 | 0.300000 | 10 | 4  | 6  | 1 | 0.119048 | 0.114786 |
| 10 | 3  | 2  | 0 | 0.466667 | 0.466667 | 10 | 4  | 6  | 2 | 0.547619 | 0.428571 |
| 10 | 3  | 2  | 1 | 0.933333 | 0.466667 | 10 | 4  | 6  | 3 | 0.928571 | 0.380952 |
| 10 | 3  | 2  | 2 | 1.000000 | 0.066667 | 10 | 4  | 6  | 4 | 1.000000 | 0.071429 |
| 10 | 3  | 3  | 0 | 0.291667 | 0.291667 | 10 | 4  | 7  | 1 | 0.033333 | 0.033333 |
| 10 | 3  | 3  | 1 | 0.816667 | 0.525000 | 10 | 4  | 7  | 2 | 0.333333 | 0.300000 |
| 10 | 3  | 3  | 2 | 0.991667 | 0.175000 | 10 | 4  | 7  | 3 | 0.833333 | 0.500000 |
| 10 | 3  | 3  | 3 | 1.000000 | 0.008333 | 10 | 4  | 7  | 4 | 1.000000 | 0.166667 |
| 10 | 3  | 4  | 0 | 0.166667 | 0.166667 | 10 | 4  | 8  | 2 | 0.133333 | 0.133333 |
| 10 | 3  | 4  | 1 | 0.666667 | 0.500000 | 10 | 4  | 8  | 3 | 0.666667 | 0.533333 |
| 10 | 3  | 4  | 2 | 0.966667 | 0.300000 | 10 | 4  | 8  | 4 | 1.000000 | 0.333333 |
| 10 | 3  | 4  | 3 | 1.000000 | 0.033333 | 10 | 4  | 9  | 3 | 0.400000 | 0.400000 |
| 10 | 3  | 5  | 0 | 0.083333 | 0.083333 | 10 | 4  | 9  | 4 | 1.000000 | 0.600000 |
| 10 | 3  | 5  | 1 | 0.500000 | 0.416667 | 10 | 4  | 10 | 4 | 1.000000 | 1.000000 |
| 10 | 3  | 5  | 2 | 0.916667 | 0.416667 | 10 | 5  | 1  | 0 | 0.500000 | 0.500000 |
| 10 | 3  | 5  | 3 | 1.000000 | 0.083333 | 10 | 5  | 1  | 1 | 1.000000 | 0.500000 |
| 10 | 3  | 6  | 0 | 0.033333 | 0.033333 | 10 | 5  | 2  | 0 | 0.222222 | 0.222222 |
| 10 | 3  | 6  | 1 | 0.333333 | 0.300000 | 10 | 5  | 2  | 1 | 0.777778 | 0.555556 |
| 10 | 3  | 6  | 2 | 0.833333 | 0.500000 | 10 | 5  | 2  | 2 | 1.000000 | 0.222222 |
| 10 | 3  | 6  | 3 | 1.000000 | 0.166667 | 10 | 5  | 3  | 0 | 0.083333 | 0.083333 |
| 10 | 3  | 7  | 0 | 0.008333 | 0.008333 | 10 | 5  | 3  | 1 | 0.500000 | 0.416667 |
| 10 | 3  | 7  | 1 | 0.183333 | 0.175000 | 10 | 5  | 3  | 2 | 0.916667 | 0.416667 |
| 10 | 3  | 7  | 2 | 0.708333 | 0.525000 | 10 | 5  | 3  | 3 | 1.000000 | 0.083333 |
| 10 | 3  | 7  | 3 | 1.000000 | 0.291667 | 10 | 5  | 4  | 0 | 0.023810 | 0.023810 |
| 10 | 3  | 8  | 1 | 0.066667 | 0.066667 | 10 | 5  | 4  | 1 | 0.261905 | 0.238095 |
| 10 | 3  | 8  | 2 | 0.533333 | 0.466667 | 10 | 5  | 4  | 2 | 0.738095 | 0.476190 |
| 10 | 3  | 8  | 3 | 1.000000 | 0.466667 | 10 | 5  | 4  | 3 | 0.976190 | 0.238095 |
| 10 | 3  | 9  | 2 | 0.300000 | 0.300000 | 10 | 5  | 4  | 4 | 1.000000 | 0.023810 |
| 10 | 3  | 9  | 3 | 1.000000 | 0.700000 | 10 | 5  | 5  | 0 | 0.003968 | 0.003968 |
| 10 | 3  | 10 | 3 | 1.000000 | 1.000000 | 10 | 5  | 5  | 1 | 0.103175 | 0.099206 |
| 10 | 4  | 1  | 0 | 0.600000 | 0.600000 | 10 | 5  | 5  | 2 | 0.500000 | 0.396825 |
| 10 | 4  | 1  | 1 | 1.000000 | 0.400000 | 10 | 5  | 5  | 3 | 0.896825 | 0.396825 |
| 10 | 4  | 2  | 0 | 0.333333 | 0.333333 | 10 | 5  | 5  | 4 | 0.996032 | 0.099206 |
| 10 | 4  | 2  | 1 | 0.866667 | 0.533333 | 10 | 5  | 5  | 5 | 1.000000 | 0.003968 |



| N  | NS | K  | X | P(<=X)   | P(=X)    | N  | NS | K  | X | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|----|----|----|---|----------|----------|
| 10 | 5  | 6  | 1 | 0.023810 | 0.023810 | 10 | 7  | 1  | 1 | 1.000000 | 0.700000 |
| 10 | 5  | 6  | 2 | 0.261905 | 0.238095 | 10 | 7  | 2  | 0 | 0.066667 | 0.066667 |
| 10 | 5  | 6  | 3 | 0.738095 | 0.476190 | 10 | 7  | 2  | 1 | 0.533333 | 0.466667 |
| 10 | 5  | 6  | 4 | 0.976190 | 0.238095 | 10 | 7  | 2  | 2 | 1.000000 | 0.466667 |
| 10 | 5  | 6  | 5 | 1.000000 | 0.023810 | 10 | 7  | 3  | 0 | 0.008333 | 0.008333 |
| 10 | 5  | 7  | 2 | 0.083333 | 0.083333 | 10 | 7  | 3  | 1 | 0.183333 | 0.175000 |
| 10 | 5  | 7  | 3 | 0.500000 | 0.416667 | 10 | 7  | 3  | 2 | 0.708333 | 0.525000 |
| 10 | 5  | 7  | 4 | 0.916667 | 0.416667 | 10 | 7  | 3  | 3 | 1.000000 | 0.291667 |
| 10 | 5  | 7  | 5 | 1.000000 | 0.083333 | 10 | 7  | 4  | 1 | 0.033333 | 0.033333 |
| 10 | 5  | 8  | 3 | 0.222222 | 0.222222 | 10 | 7  | 4  | 2 | 0.333333 | 0.300000 |
| 10 | 5  | 8  | 4 | 0.777778 | 0.555556 | 10 | 7  | 4  | 3 | 0.833333 | 0.500000 |
| 10 | 5  | 8  | 5 | 1.000000 | 0.222222 | 10 | 7  | 4  | 4 | 1.000000 | 0.166667 |
| 10 | 5  | 9  | 4 | 0.500000 | 0.500000 | 10 | 7  | 5  | 2 | 0.083333 | 0.083333 |
| 10 | 5  | 9  | 5 | 1.000000 | 0.500000 | 10 | 7  | 5  | 3 | 0.500000 | 0.416667 |
| 10 | 5  | 10 | 5 | 1.000000 | 1.000000 | 10 | 7  | 5  | 4 | 0.916667 | 0.416667 |
| 10 | 6  | 1  | 0 | 0.400000 | 0.400000 | 10 | 7  | 5  | 5 | 1.000000 | 0.083333 |
| 10 | 6  | 1  | 1 | 1.000000 | 0.600000 | 10 | 7  | 6  | 3 | 0.166667 | 0.166667 |
| 10 | 6  | 2  | 0 | 0.133333 | 0.133333 | 10 | 7  | 6  | 4 | 0.666667 | 0.500000 |
| 10 | 6  | 2  | 1 | 0.666667 | 0.533333 | 10 | 7  | 6  | 5 | 0.966667 | 0.300000 |
| 10 | 6  | 2  | 2 | 1.000000 | 0.333333 | 10 | 7  | 6  | 6 | 1.000000 | 0.033333 |
| 10 | 6  | 3  | 0 | 0.033333 | 0.033333 | 10 | 7  | 7  | 4 | 0.291667 | 0.291667 |
| 10 | 6  | 3  | 1 | 0.333333 | 0.300000 | 10 | 7  | 7  | 5 | 0.816667 | 0.525000 |
| 10 | 6  | 3  | 2 | 0.833333 | 0.500000 | 10 | 7  | 7  | 6 | 0.991667 | 0.175000 |
| 10 | 6  | 3  | 3 | 1.000000 | 0.166667 | 10 | 7  | 7  | 7 | 1.000000 | 0.008333 |
| 10 | 6  | 4  | 0 | 0.004762 | 0.004762 | 10 | 7  | 8  | 5 | 0.466667 | 0.466667 |
| 10 | 6  | 4  | 1 | 0.119048 | 0.114286 | 10 | 7  | 8  | 6 | 0.933333 | 0.466667 |
| 10 | 6  | 4  | 2 | 0.547619 | 0.428571 | 10 | 7  | 8  | 7 | 1.000000 | 0.066667 |
| 10 | 6  | 4  | 3 | 0.928571 | 0.380952 | 10 | 7  | 9  | 6 | 0.700000 | 0.700000 |
| 10 | 6  | 4  | 4 | 1.000000 | 0.071429 | 10 | 7  | 9  | 7 | 1.000000 | 0.300000 |
| 10 | 6  | 5  | 1 | 0.023810 | 0.023810 | 10 | 7  | 10 | 7 | 1.000000 | 1.000000 |
| 10 | 6  | 5  | 2 | 0.261905 | 0.238095 | 10 | 8  | 1  | 0 | 0.200000 | 0.200000 |
| 10 | 6  | 5  | 3 | 0.738095 | 0.476190 | 10 | 8  | 1  | 1 | 1.000000 | 0.800000 |
| 10 | 6  | 5  | 4 | 0.976190 | 0.238095 | 10 | 8  | 2  | 0 | 0.022222 | 0.022222 |
| 10 | 6  | 5  | 5 | 1.000000 | 0.023810 | 10 | 8  | 2  | 1 | 0.377778 | 0.355556 |
| 10 | 6  | 6  | 2 | 0.071429 | 0.071429 | 10 | 8  | 2  | 2 | 1.000000 | 0.622222 |
| 10 | 6  | 6  | 3 | 0.452381 | 0.380952 | 10 | 8  | 3  | 1 | 0.066667 | 0.066667 |
| 10 | 6  | 6  | 4 | 0.880952 | 0.428571 | 10 | 8  | 3  | 2 | 0.533333 | 0.466667 |
| 10 | 6  | 6  | 5 | 0.995238 | 0.114286 | 10 | 8  | 3  | 3 | 1.000000 | 0.466667 |
| 10 | 6  | 6  | 6 | 1.000000 | 0.004762 | 10 | 8  | 4  | 2 | 0.133333 | 0.133333 |
| 10 | 6  | 7  | 3 | 0.166667 | 0.166667 | 10 | 8  | 4  | 3 | 0.666667 | 0.533333 |
| 10 | 6  | 7  | 4 | 0.666667 | 0.500000 | 10 | 8  | 4  | 4 | 1.000000 | 0.333333 |
| 10 | 6  | 7  | 5 | 0.966667 | 0.300000 | 10 | 8  | 5  | 3 | 0.222222 | 0.222222 |
| 10 | 6  | 7  | 6 | 1.000000 | 0.033333 | 10 | 8  | 5  | 4 | 0.777778 | 0.555556 |
| 10 | 6  | 8  | 4 | 0.333333 | 0.333333 | 10 | 8  | 5  | 5 | 1.000000 | 0.222222 |
| 10 | 6  | 8  | 5 | 0.866667 | 0.533333 | 10 | 8  | 6  | 4 | 0.333333 | 0.333333 |
| 10 | 6  | 8  | 6 | 1.000000 | 0.133333 | 10 | 8  | 6  | 5 | 0.866667 | 0.533333 |
| 10 | 6  | 9  | 5 | 0.600000 | 0.600000 | 10 | 8  | 6  | 6 | 1.000000 | 0.133333 |
| 10 | 6  | 9  | 6 | 1.000000 | 0.400000 | 10 | 8  | 7  | 5 | 0.466667 | 0.466667 |
| 10 | 6  | 10 | 6 | 1.000000 | 1.000000 | 10 | 8  | 7  | 6 | 0.933333 | 0.466667 |
| 10 | 7  | 1  | 0 | 0.300000 | 0.300000 | 10 | 8  | 7  | 7 | 1.000000 | 0.066667 |

| N  | NS | K  | X | P(<=X)   | P(=X)    | N  | NS | K  | X | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|----|----|----|---|----------|----------|
| 10 | 8  | 8  | 6 | 0.622222 | 0.622222 | 11 | 2  | 2  | 2 | 1.000000 | 0.018182 |
| 10 | 8  | 8  | 7 | 0.977778 | 0.355556 | 11 | 2  | 3  | 0 | 0.509091 | 0.509091 |
| 10 | 8  | 8  | 8 | 1.000000 | 0.022222 | 11 | 2  | 3  | 1 | 0.945455 | 0.436364 |
| 10 | 8  | 9  | 7 | 0.800000 | 0.800000 | 11 | 2  | 3  | 2 | 1.000000 | 0.054545 |
| 10 | 8  | 9  | 8 | 1.000000 | 0.200000 | 11 | 2  | 4  | 0 | 0.381818 | 0.381818 |
| 10 | 8  | 10 | 8 | 1.000000 | 1.000000 | 11 | 2  | 4  | 1 | 0.890909 | 0.509091 |
| 10 | 9  | 1  | 0 | 0.100000 | 0.100000 | 11 | 2  | 4  | 2 | 1.000000 | 0.109091 |
| 10 | 9  | 1  | 1 | 1.000000 | 0.900000 | 11 | 2  | 5  | 0 | 0.272727 | 0.272727 |
| 10 | 9  | 2  | 1 | 0.200000 | 0.200000 | 11 | 2  | 5  | 1 | 0.818182 | 0.545455 |
| 10 | 9  | 2  | 2 | 1.000000 | 0.800000 | 11 | 2  | 5  | 2 | 1.000000 | 0.181818 |
| 10 | 9  | 3  | 2 | 0.300000 | 0.300000 | 11 | 2  | 6  | 0 | 0.181818 | 0.181818 |
| 10 | 9  | 3  | 3 | 1.000000 | 0.700000 | 11 | 2  | 6  | 1 | 0.727273 | 0.545455 |
| 10 | 9  | 4  | 3 | 0.400000 | 0.400000 | 11 | 2  | 6  | 2 | 1.000000 | 0.272727 |
| 10 | 9  | 4  | 4 | 1.000000 | 0.600000 | 11 | 2  | 7  | 0 | 0.109091 | 0.109091 |
| 10 | 9  | 5  | 4 | 0.500000 | 0.500000 | 11 | 2  | 7  | 1 | 0.618182 | 0.509091 |
| 10 | 9  | 5  | 5 | 1.000000 | 0.500000 | 11 | 2  | 7  | 2 | 1.000000 | 0.381818 |
| 10 | 9  | 6  | 5 | 0.600000 | 0.600000 | 11 | 2  | 8  | 0 | 0.054545 | 0.054545 |
| 10 | 9  | 6  | 6 | 1.000000 | 0.400000 | 11 | 2  | 8  | 1 | 0.490909 | 0.436364 |
| 10 | 9  | 7  | 6 | 0.700000 | 0.700000 | 11 | 2  | 8  | 2 | 1.000000 | 0.509091 |
| 10 | 9  | 7  | 7 | 1.000000 | 0.300000 | 11 | 2  | 9  | 0 | 0.018182 | 0.018182 |
| 10 | 9  | 8  | 7 | 0.800000 | 0.800000 | 11 | 2  | 9  | 1 | 0.345455 | 0.327273 |
| 10 | 9  | 8  | 8 | 1.000000 | 0.200000 | 11 | 2  | 9  | 2 | 1.000000 | 0.654545 |
| 10 | 9  | 9  | 8 | 0.900000 | 0.900000 | 11 | 2  | 10 | 1 | 0.181818 | 0.181818 |
| 10 | 9  | 9  | 9 | 1.000000 | 0.100000 | 11 | 2  | 10 | 2 | 1.000000 | 0.818182 |
| 10 | 9  | 10 | 9 | 1.000000 | 1.000000 | 11 | 2  | 11 | 2 | 1.000000 | 1.000000 |
| 11 | 1  | 1  | 0 | 0.909091 | 0.909091 | 11 | 3  | 1  | 0 | 0.727273 | 0.727273 |
| 11 | 1  | 1  | 1 | 1.000000 | 0.090909 | 11 | 3  | 1  | 1 | 1.000000 | 0.272727 |
| 11 | 1  | 2  | 0 | 0.818182 | 0.818182 | 11 | 3  | 2  | 0 | 0.509091 | 0.509091 |
| 11 | 1  | 2  | 1 | 1.000000 | 0.181818 | 11 | 3  | 2  | 1 | 0.945455 | 0.436364 |
| 11 | 1  | 3  | 0 | 0.727273 | 0.727273 | 11 | 3  | 2  | 2 | 1.000000 | 0.054545 |
| 11 | 1  | 3  | 1 | 1.000000 | 0.272727 | 11 | 3  | 3  | 0 | 0.339394 | 0.339394 |
| 11 | 1  | 4  | 0 | 0.636364 | 0.636364 | 11 | 3  | 3  | 1 | 0.848485 | 0.509091 |
| 11 | 1  | 4  | 1 | 1.000000 | 0.363636 | 11 | 3  | 3  | 2 | 0.993939 | 0.145455 |
| 11 | 1  | 5  | 0 | 0.545455 | 0.545455 | 11 | 3  | 3  | 3 | 1.000000 | 0.006061 |
| 11 | 1  | 5  | 1 | 1.000000 | 0.454545 | 11 | 3  | 4  | 0 | 0.212121 | 0.212121 |
| 11 | 1  | 6  | 0 | 0.454545 | 0.454545 | 11 | 3  | 4  | 1 | 0.721212 | 0.509091 |
| 11 | 1  | 6  | 1 | 1.000000 | 0.545455 | 11 | 3  | 4  | 2 | 0.975758 | 0.254545 |
| 11 | 1  | 7  | 0 | 0.363636 | 0.363636 | 11 | 3  | 4  | 3 | 1.000000 | 0.024242 |
| 11 | 1  | 7  | 1 | 1.000000 | 0.636364 | 11 | 3  | 5  | 0 | 0.121212 | 0.121212 |
| 11 | 1  | 8  | 0 | 0.272727 | 0.272727 | 11 | 3  | 5  | 1 | 0.575758 | 0.454545 |
| 11 | 1  | 8  | 1 | 1.000000 | 0.727273 | 11 | 3  | 5  | 2 | 0.939394 | 0.363636 |
| 11 | 1  | 9  | 0 | 0.181818 | 0.181818 | 11 | 3  | 5  | 3 | 1.000000 | 0.060606 |
| 11 | 1  | 9  | 1 | 1.000000 | 0.818182 | 11 | 3  | 6  | 0 | 0.060606 | 0.060606 |
| 11 | 1  | 10 | 0 | 0.090909 | 0.090909 | 11 | 3  | 6  | 1 | 0.424242 | 0.363636 |
| 11 | 1  | 10 | 1 | 1.000000 | 0.909091 | 11 | 3  | 6  | 2 | 0.878788 | 0.454545 |
| 11 | 1  | 11 | 1 | 1.000000 | 1.000000 | 11 | 3  | 6  | 3 | 1.000000 | 0.121212 |
| 11 | 2  | 1  | 0 | 0.818182 | 0.818182 | 11 | 3  | 7  | 0 | 0.024242 | 0.024242 |
| 11 | 2  | 1  | 1 | 1.000000 | 0.181818 | 11 | 3  | 7  | 1 | 0.278788 | 0.254545 |
| 11 | 2  | 2  | 0 | 0.654545 | 0.654545 | 11 | 3  | 7  | 2 | 0.787879 | 0.509091 |
| 11 | 2  | 2  | 1 | 0.981818 | 0.327273 | 11 | 3  | 7  | 3 | 1.000000 | 0.212121 |

| N  | NS | K  | X | P(<=X)   | P(=X)    | N  | NS | K  | X | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|----|----|----|---|----------|----------|
| 11 | 3  | 8  | 0 | 0.006061 | 0.006061 | 11 | 5  | 1  | 1 | 1.000000 | 0.454545 |
| 11 | 3  | 8  | 1 | 0.151515 | 0.145455 | 11 | 5  | 2  | 0 | 0.272727 | 0.272727 |
| 11 | 3  | 8  | 2 | 0.660606 | 0.509091 | 11 | 5  | 2  | 1 | 0.818182 | 0.545455 |
| 11 | 3  | 8  | 3 | 1.000000 | 0.339394 | 11 | 5  | 2  | 2 | 1.000000 | 0.181818 |
| 11 | 3  | 9  | 1 | 0.054545 | 0.054545 | 11 | 5  | 3  | 0 | 0.121212 | 0.121212 |
| 11 | 3  | 9  | 2 | 0.490909 | 0.436364 | 11 | 5  | 3  | 1 | 0.575758 | 0.454545 |
| 11 | 3  | 9  | 3 | 1.000000 | 0.509091 | 11 | 5  | 3  | 2 | 0.939394 | 0.363636 |
| 11 | 3  | 10 | 2 | 0.272727 | 0.272727 | 11 | 5  | 3  | 3 | 1.000000 | 0.060606 |
| 11 | 3  | 10 | 3 | 1.000000 | 0.727273 | 11 | 5  | 4  | 0 | 0.045455 | 0.045455 |
| 11 | 3  | 11 | 3 | 1.000000 | 1.000000 | 11 | 5  | 4  | 1 | 0.348485 | 0.303030 |
| 11 | 4  | 1  | 0 | 0.636364 | 0.636364 | 11 | 5  | 4  | 2 | 0.803030 | 0.454545 |
| 11 | 4  | 1  | 1 | 1.000000 | 0.363636 | 11 | 5  | 4  | 3 | 0.984848 | 0.181818 |
| 11 | 4  | 2  | 0 | 0.381818 | 0.381818 | 11 | 5  | 4  | 4 | 1.000000 | 0.015152 |
| 11 | 4  | 2  | 1 | 0.890909 | 0.509091 | 11 | 5  | 5  | 0 | 0.012987 | 0.012987 |
| 11 | 4  | 2  | 2 | 1.000000 | 0.109091 | 11 | 5  | 5  | 1 | 0.175325 | 0.162338 |
| 11 | 4  | 3  | 0 | 0.212121 | 0.212121 | 11 | 5  | 5  | 2 | 0.608225 | 0.432900 |
| 11 | 4  | 3  | 1 | 0.721212 | 0.509091 | 11 | 5  | 5  | 3 | 0.932900 | 0.324675 |
| 11 | 4  | 3  | 2 | 0.975758 | 0.254545 | 11 | 5  | 5  | 4 | 0.997835 | 0.064935 |
| 11 | 4  | 3  | 3 | 1.000000 | 0.024242 | 11 | 5  | 5  | 5 | 1.000000 | 0.002165 |
| 11 | 4  | 4  | 0 | 0.106061 | 0.106061 | 11 | 5  | 6  | 0 | 0.002165 | 0.002165 |
| 11 | 4  | 4  | 1 | 0.530303 | 0.424242 | 11 | 5  | 6  | 1 | 0.067100 | 0.064935 |
| 11 | 4  | 4  | 2 | 0.912121 | 0.381818 | 11 | 5  | 6  | 2 | 0.391775 | 0.324675 |
| 11 | 4  | 4  | 3 | 0.996970 | 0.084848 | 11 | 5  | 6  | 3 | 0.824675 | 0.432900 |
| 11 | 4  | 4  | 4 | 1.000000 | 0.003030 | 11 | 5  | 6  | 4 | 0.987013 | 0.162338 |
| 11 | 4  | 5  | 0 | 0.045455 | 0.045455 | 11 | 5  | 6  | 5 | 1.000000 | 0.012987 |
| 11 | 4  | 5  | 1 | 0.348485 | 0.303030 | 11 | 5  | 7  | 1 | 0.015152 | 0.015152 |
| 11 | 4  | 5  | 2 | 0.803030 | 0.454545 | 11 | 5  | 7  | 2 | 0.196970 | 0.181818 |
| 11 | 4  | 5  | 3 | 0.984848 | 0.181818 | 11 | 5  | 7  | 3 | 0.651515 | 0.454545 |
| 11 | 4  | 5  | 4 | 1.000000 | 0.015152 | 11 | 5  | 7  | 4 | 0.954545 | 0.303030 |
| 11 | 4  | 6  | 0 | 0.015152 | 0.015152 | 11 | 5  | 7  | 5 | 1.000000 | 0.045455 |
| 11 | 4  | 6  | 1 | 0.196970 | 0.181818 | 11 | 5  | 8  | 2 | 0.060606 | 0.060606 |
| 11 | 4  | 6  | 2 | 0.651515 | 0.454545 | 11 | 5  | 8  | 3 | 0.424242 | 0.363636 |
| 11 | 4  | 6  | 3 | 0.954545 | 0.303030 | 11 | 5  | 8  | 4 | 0.878788 | 0.454545 |
| 11 | 4  | 6  | 4 | 1.000000 | 0.045455 | 11 | 5  | 8  | 5 | 1.000000 | 0.121212 |
| 11 | 4  | 7  | 0 | 0.003030 | 0.003030 | 11 | 5  | 9  | 3 | 0.181818 | 0.181818 |
| 11 | 4  | 7  | 1 | 0.087879 | 0.084848 | 11 | 5  | 9  | 4 | 0.727273 | 0.545455 |
| 11 | 4  | 7  | 2 | 0.469697 | 0.381818 | 11 | 5  | 9  | 5 | 1.000000 | 0.272727 |
| 11 | 4  | 7  | 3 | 0.893939 | 0.424242 | 11 | 5  | 10 | 4 | 0.454545 | 0.454545 |
| 11 | 4  | 7  | 4 | 1.000000 | 0.106061 | 11 | 5  | 10 | 5 | 1.000000 | 0.545455 |
| 11 | 4  | 8  | 1 | 0.024242 | 0.024242 | 11 | 5  | 11 | 5 | 1.000000 | 1.000000 |
| 11 | 4  | 8  | 2 | 0.278788 | 0.254545 | 11 | 6  | 1  | 0 | 0.454545 | 0.454545 |
| 11 | 4  | 8  | 3 | 0.787879 | 0.509091 | 11 | 6  | 1  | 1 | 1.000000 | 0.545455 |
| 11 | 4  | 8  | 4 | 1.000000 | 0.212121 | 11 | 6  | 2  | 0 | 0.181818 | 0.181818 |
| 11 | 4  | 9  | 2 | 0.109091 | 0.109091 | 11 | 6  | 2  | 1 | 0.727273 | 0.545455 |
| 11 | 4  | 9  | 3 | 0.618182 | 0.509091 | 11 | 6  | 2  | 2 | 1.000000 | 0.272727 |
| 11 | 4  | 9  | 4 | 1.000000 | 0.381818 | 11 | 6  | 3  | 0 | 0.060606 | 0.060606 |
| 11 | 4  | 10 | 3 | 0.363636 | 0.363636 | 11 | 6  | 3  | 1 | 0.424242 | 0.363636 |
| 11 | 4  | 10 | 4 | 1.000000 | 0.636364 | 11 | 6  | 3  | 2 | 0.878788 | 0.454545 |
| 11 | 4  | 11 | 4 | 1.000000 | 1.000000 | 11 | 6  | 3  | 3 | 1.000000 | 0.121212 |
| 11 | 5  | 1  | 0 | 0.545455 | 0.545455 | 11 | 6  | 4  | 0 | 0.015152 | 0.015152 |

| N  | NS | K  | X | P(<=X)   | P(=X)    | N  | NS | K  | X | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|----|----|----|---|----------|----------|
| 11 | 6  | 4  | 1 | 0.196970 | 0.181818 | 11 | 7  | 6  | 2 | 0.045455 | 0.045455 |
| 11 | 6  | 4  | 2 | 0.651515 | 0.454545 | 11 | 7  | 6  | 3 | 0.348485 | 0.303030 |
| 11 | 6  | 4  | 3 | 0.954545 | 0.303030 | 11 | 7  | 6  | 4 | 0.803030 | 0.454545 |
| 11 | 6  | 4  | 4 | 1.000000 | 0.045455 | 11 | 7  | 6  | 5 | 0.984848 | 0.181818 |
| 11 | 6  | 5  | 0 | 0.002165 | 0.002165 | 11 | 7  | 6  | 6 | 1.000000 | 0.015152 |
| 11 | 6  | 5  | 1 | 0.067100 | 0.064935 | 11 | 7  | 7  | 3 | 0.106061 | 0.106061 |
| 11 | 6  | 5  | 2 | 0.391775 | 0.324675 | 11 | 7  | 7  | 4 | 0.530303 | 0.424242 |
| 11 | 6  | 5  | 3 | 0.824675 | 0.432900 | 11 | 7  | 7  | 5 | 0.912121 | 0.381818 |
| 11 | 6  | 5  | 4 | 0.987013 | 0.162338 | 11 | 7  | 7  | 6 | 0.996970 | 0.084848 |
| 11 | 6  | 5  | 5 | 1.000000 | 0.012987 | 11 | 7  | 7  | 7 | 1.000000 | 0.003030 |
| 11 | 6  | 6  | 1 | 0.012987 | 0.012987 | 11 | 7  | 8  | 4 | 0.212121 | 0.212121 |
| 11 | 6  | 6  | 2 | 0.175325 | 0.162338 | 11 | 7  | 8  | 5 | 0.721212 | 0.509091 |
| 11 | 6  | 6  | 3 | 0.608225 | 0.432900 | 11 | 7  | 8  | 6 | 0.975758 | 0.254545 |
| 11 | 6  | 6  | 4 | 0.932900 | 0.324675 | 11 | 7  | 8  | 7 | 1.000000 | 0.024242 |
| 11 | 6  | 6  | 5 | 0.997835 | 0.064935 | 11 | 7  | 9  | 5 | 0.381818 | 0.381818 |
| 11 | 6  | 6  | 6 | 1.000000 | 0.002165 | 11 | 7  | 9  | 6 | 0.890909 | 0.509091 |
| 11 | 6  | 7  | 2 | 0.045455 | 0.045455 | 11 | 7  | 9  | 7 | 1.000000 | 0.109091 |
| 11 | 6  | 7  | 3 | 0.348485 | 0.303030 | 11 | 7  | 10 | 6 | 0.636364 | 0.636364 |
| 11 | 6  | 7  | 4 | 0.803030 | 0.454545 | 11 | 7  | 10 | 7 | 1.000000 | 0.363636 |
| 11 | 6  | 7  | 5 | 0.984848 | 0.181818 | 11 | 7  | 11 | 7 | 1.000000 | 1.000000 |
| 11 | 6  | 7  | 6 | 1.000000 | 0.015152 | 11 | 8  | 1  | 0 | 0.272727 | 0.272727 |
| 11 | 6  | 8  | 3 | 0.121212 | 0.121212 | 11 | 8  | 1  | 1 | 1.000000 | 0.727273 |
| 11 | 6  | 8  | 4 | 0.575758 | 0.454545 | 11 | 8  | 2  | 0 | 0.054545 | 0.054545 |
| 11 | 6  | 8  | 5 | 0.939394 | 0.363636 | 11 | 8  | 2  | 1 | 0.490909 | 0.436364 |
| 11 | 6  | 8  | 6 | 1.000000 | 0.060606 | 11 | 8  | 2  | 2 | 1.000000 | 0.509091 |
| 11 | 6  | 9  | 4 | 0.272727 | 0.272727 | 11 | 8  | 3  | 0 | 0.006061 | 0.006061 |
| 11 | 6  | 9  | 5 | 0.818182 | 0.545455 | 11 | 8  | 3  | 1 | 0.151515 | 0.145455 |
| 11 | 6  | 9  | 6 | 1.000000 | 0.181818 | 11 | 8  | 3  | 2 | 0.660606 | 0.509091 |
| 11 | 6  | 10 | 5 | 0.545455 | 0.545455 | 11 | 8  | 3  | 3 | 1.000000 | 0.339394 |
| 11 | 6  | 10 | 6 | 1.000000 | 0.454545 | 11 | 8  | 4  | 1 | 0.024242 | 0.024242 |
| 11 | 6  | 11 | 6 | 1.000000 | 1.000000 | 11 | 8  | 4  | 2 | 0.278788 | 0.254545 |
| 11 | 7  | 1  | 0 | 0.363636 | 0.363636 | 11 | 8  | 4  | 3 | 0.787879 | 0.509091 |
| 11 | 7  | 1  | 1 | 1.000000 | 0.636364 | 11 | 8  | 4  | 4 | 1.000000 | 0.212121 |
| 11 | 7  | 2  | 0 | 0.109091 | 0.109091 | 11 | 8  | 5  | 2 | 0.060606 | 0.060606 |
| 11 | 7  | 2  | 1 | 0.618182 | 0.509091 | 11 | 8  | 5  | 3 | 0.424242 | 0.363636 |
| 11 | 7  | 2  | 2 | 1.000000 | 0.381818 | 11 | 8  | 5  | 4 | 0.878788 | 0.454545 |
| 11 | 7  | 3  | 0 | 0.024242 | 0.024242 | 11 | 8  | 5  | 5 | 1.000000 | 0.121212 |
| 11 | 7  | 3  | 1 | 0.278788 | 0.254545 | 11 | 8  | 6  | 3 | 0.121212 | 0.121212 |
| 11 | 7  | 3  | 2 | 0.787879 | 0.509091 | 11 | 8  | 6  | 4 | 0.575758 | 0.454545 |
| 11 | 7  | 3  | 3 | 1.000000 | 0.212121 | 11 | 8  | 6  | 5 | 0.939394 | 0.363636 |
| 11 | 7  | 4  | 0 | 0.003030 | 0.003030 | 11 | 8  | 6  | 6 | 1.000000 | 0.060606 |
| 11 | 7  | 4  | 1 | 0.087879 | 0.084848 | 11 | 8  | 7  | 4 | 0.212121 | 0.212121 |
| 11 | 7  | 4  | 2 | 0.469697 | 0.381818 | 11 | 8  | 7  | 5 | 0.721212 | 0.509091 |
| 11 | 7  | 4  | 3 | 0.893939 | 0.424242 | 11 | 8  | 7  | 6 | 0.975758 | 0.254545 |
| 11 | 7  | 4  | 4 | 1.000000 | 0.106061 | 11 | 8  | 7  | 7 | 1.000000 | 0.024242 |
| 11 | 7  | 5  | 1 | 0.015152 | 0.015152 | 11 | 8  | 8  | 5 | 0.339394 | 0.339394 |
| 11 | 7  | 5  | 2 | 0.196970 | 0.181818 | 11 | 8  | 8  | 6 | 0.848485 | 0.509091 |
| 11 | 7  | 5  | 3 | 0.651515 | 0.454545 | 11 | 8  | 8  | 7 | 0.993939 | 0.145455 |
| 11 | 7  | 5  | 4 | 0.954545 | 0.303030 | 11 | 8  | 8  | 8 | 1.000000 | 0.006061 |
| 11 | 7  | 5  | 5 | 1.000000 | 0.045455 | 11 | 8  | 9  | 6 | 0.509091 | 0.509091 |

| N  | NS | R  | X | P(<=X)   | P(=X)    | N  | NS | R  | X  | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|----|----|----|----|----------|----------|
| 11 | 8  | 9  | 7 | 0.945455 | 0.436364 | 11 | 10 | 9  | 8  | 0.818182 | 0.818182 |
| 11 | 8  | 9  | 8 | 1.000000 | 0.054545 | 11 | 10 | 9  | 9  | 1.000000 | 0.181818 |
| 11 | 8  | 10 | 7 | 0.727273 | 0.727273 | 11 | 10 | 10 | 9  | 0.909091 | 0.909091 |
| 11 | 8  | 10 | 8 | 1.000000 | 0.272727 | 11 | 10 | 10 | 10 | 1.000000 | 0.090909 |
| 11 | 8  | 11 | 8 | 1.000000 | 1.000000 | 11 | 10 | 11 | 10 | 1.000000 | 1.000000 |
| 11 | 9  | 1  | 0 | 0.181818 | 0.181818 | 12 | 1  | 1  | 0  | 0.916667 | 0.916667 |
| 11 | 9  | 1  | 1 | 1.000000 | 0.818182 | 12 | 1  | 1  | 1  | 1.000000 | 0.083333 |
| 11 | 9  | 2  | 0 | 0.018182 | 0.018182 | 12 | 1  | 2  | 0  | 0.833333 | 0.833333 |
| 11 | 9  | 2  | 1 | 0.345455 | 0.327273 | 12 | 1  | 2  | 1  | 1.000000 | 0.166667 |
| 11 | 9  | 2  | 2 | 1.000000 | 0.654545 | 12 | 1  | 3  | 0  | 0.750000 | 0.750000 |
| 11 | 9  | 3  | 1 | 0.054545 | 0.054545 | 12 | 1  | 3  | 1  | 1.000000 | 0.250000 |
| 11 | 9  | 3  | 2 | 0.490909 | 0.436364 | 12 | 1  | 4  | 0  | 0.666667 | 0.666667 |
| 11 | 9  | 3  | 3 | 1.000000 | 0.509091 | 12 | 1  | 4  | 1  | 1.000000 | 0.333333 |
| 11 | 9  | 4  | 2 | 0.109091 | 0.109091 | 12 | 1  | 5  | 0  | 0.583333 | 0.583333 |
| 11 | 9  | 4  | 3 | 0.618182 | 0.509091 | 12 | 1  | 5  | 1  | 1.000000 | 0.416667 |
| 11 | 9  | 4  | 4 | 1.000000 | 0.381818 | 12 | 1  | 6  | 0  | 0.500000 | 0.500000 |
| 11 | 9  | 5  | 3 | 0.181818 | 0.181818 | 12 | 1  | 6  | 1  | 1.000000 | 0.500000 |
| 11 | 9  | 5  | 4 | 0.727273 | 0.545455 | 12 | 1  | 7  | 0  | 0.416667 | 0.416667 |
| 11 | 9  | 5  | 5 | 1.000000 | 0.272727 | 12 | 1  | 7  | 1  | 1.000000 | 0.583333 |
| 11 | 9  | 6  | 4 | 0.272727 | 0.272727 | 12 | 1  | 8  | 0  | 0.333333 | 0.333333 |
| 11 | 9  | 6  | 5 | 0.818182 | 0.545455 | 12 | 1  | 8  | 1  | 1.000000 | 0.666667 |
| 11 | 9  | 6  | 6 | 1.000000 | 0.181818 | 12 | 1  | 9  | 0  | 0.250000 | 0.250000 |
| 11 | 9  | 7  | 5 | 0.381818 | 0.381818 | 12 | 1  | 9  | 1  | 1.000000 | 0.750000 |
| 11 | 9  | 7  | 6 | 0.890909 | 0.509091 | 12 | 1  | 10 | 0  | 0.166667 | 0.166667 |
| 11 | 9  | 7  | 7 | 1.000000 | 0.109091 | 12 | 1  | 10 | 1  | 1.000000 | 0.833333 |
| 11 | 9  | 8  | 6 | 0.509091 | 0.509091 | 12 | 1  | 11 | 0  | 0.083333 | 0.083333 |
| 11 | 9  | 8  | 7 | 0.945455 | 0.436364 | 12 | 1  | 11 | 1  | 1.000000 | 0.916667 |
| 11 | 9  | 8  | 8 | 1.000000 | 0.054545 | 12 | 1  | 12 | 1  | 1.000000 | 1.000000 |
| 11 | 9  | 9  | 7 | 0.654545 | 0.654545 | 12 | 2  | 1  | 0  | 0.833333 | 0.833333 |
| 11 | 9  | 9  | 8 | 0.981818 | 0.327273 | 12 | 2  | 1  | 1  | 1.000000 | 0.166667 |
| 11 | 9  | 9  | 9 | 1.000000 | 0.018182 | 12 | 2  | 2  | 0  | 0.681818 | 0.681818 |
| 11 | 9  | 10 | 8 | 0.818182 | 0.818182 | 12 | 2  | 2  | 1  | 0.984848 | 0.303030 |
| 11 | 9  | 10 | 9 | 1.000000 | 0.181818 | 12 | 2  | 2  | 2  | 1.000000 | 0.015152 |
| 11 | 9  | 11 | 9 | 1.000000 | 1.000000 | 12 | 2  | 3  | 0  | 0.545455 | 0.545455 |
| 11 | 10 | 1  | 0 | 0.090909 | 0.090909 | 12 | 2  | 3  | 1  | 0.954545 | 0.409091 |
| 11 | 10 | 1  | 1 | 1.000000 | 0.909091 | 12 | 2  | 3  | 2  | 1.000000 | 0.045455 |
| 11 | 10 | 2  | 1 | 0.181818 | 0.181818 | 12 | 2  | 4  | 0  | 0.424242 | 0.424242 |
| 11 | 10 | 2  | 2 | 1.000000 | 0.818182 | 12 | 2  | 4  | 1  | 0.909091 | 0.484848 |
| 11 | 10 | 3  | 2 | 0.272727 | 0.272727 | 12 | 2  | 4  | 2  | 1.000000 | 0.090909 |
| 11 | 10 | 3  | 3 | 1.000000 | 0.727273 | 12 | 2  | 5  | 0  | 0.318182 | 0.318182 |
| 11 | 10 | 4  | 3 | 0.363636 | 0.363636 | 12 | 2  | 5  | 1  | 0.848485 | 0.530303 |
| 11 | 10 | 4  | 4 | 1.000000 | 0.636364 | 12 | 2  | 5  | 2  | 1.000000 | 0.151515 |
| 11 | 10 | 5  | 4 | 0.454545 | 0.454545 | 12 | 2  | 6  | 0  | 0.227273 | 0.227273 |
| 11 | 10 | 5  | 5 | 1.000000 | 0.545455 | 12 | 2  | 6  | 1  | 0.772727 | 0.545455 |
| 11 | 10 | 6  | 5 | 0.545455 | 0.545455 | 12 | 2  | 6  | 2  | 1.000000 | 0.227273 |
| 11 | 10 | 6  | 6 | 1.000000 | 0.454545 | 12 | 2  | 7  | 0  | 0.151515 | 0.151515 |
| 11 | 10 | 7  | 6 | 0.636364 | 0.636364 | 12 | 2  | 7  | 1  | 0.681818 | 0.530303 |
| 11 | 10 | 7  | 7 | 1.000000 | 0.363636 | 12 | 2  | 7  | 2  | 1.000000 | 0.318182 |
| 11 | 10 | 8  | 7 | 0.727273 | 0.727273 | 12 | 2  | 8  | 0  | 0.090909 | 0.090909 |
| 11 | 10 | 8  | 8 | 1.000000 | 0.272727 | 12 | 2  | 8  | 1  | 0.575758 | 0.484848 |

| N  | NS | K  | X | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|
| 12 | 2  | 8  | 2 | 1.000000 | 0.424242 |
| 12 | 2  | 9  | 0 | 0.045455 | 0.045455 |
| 12 | 2  | 9  | 1 | 0.454545 | 0.409091 |
| 12 | 2  | 9  | 2 | 1.000000 | 0.545455 |
| 12 | 2  | 10 | 0 | 0.015152 | 0.015152 |
| 12 | 2  | 10 | 1 | 0.318182 | 0.303030 |
| 12 | 2  | 10 | 2 | 1.000000 | 0.681818 |
| 12 | 2  | 11 | 1 | 0.166667 | 0.166667 |
| 12 | 2  | 11 | 2 | 1.000000 | 0.833333 |
| 12 | 2  | 12 | 2 | 1.000000 | 1.000000 |
| 12 | 3  | 1  | 0 | 0.750000 | 0.750000 |
| 12 | 3  | 1  | 1 | 1.000000 | 0.250000 |
| 12 | 3  | 2  | 0 | 0.545455 | 0.545455 |
| 12 | 3  | 2  | 1 | 0.954545 | 0.409091 |
| 12 | 3  | 2  | 2 | 1.000000 | 0.045455 |
| 12 | 3  | 3  | 0 | 0.381818 | 0.381818 |
| 12 | 3  | 3  | 1 | 0.872727 | 0.490909 |
| 12 | 3  | 3  | 2 | 0.995455 | 0.122727 |
| 12 | 3  | 3  | 3 | 1.000000 | 0.004545 |
| 12 | 3  | 4  | 0 | 0.254545 | 0.254545 |
| 12 | 3  | 4  | 1 | 0.763636 | 0.509091 |
| 12 | 3  | 4  | 2 | 0.981818 | 0.218182 |
| 12 | 3  | 4  | 3 | 1.000000 | 0.018182 |
| 12 | 3  | 5  | 0 | 0.159091 | 0.159091 |
| 12 | 3  | 5  | 1 | 0.636364 | 0.477273 |
| 12 | 3  | 5  | 2 | 0.954545 | 0.318182 |
| 12 | 3  | 5  | 3 | 1.000000 | 0.045455 |
| 12 | 3  | 6  | 0 | 0.090909 | 0.090909 |
| 12 | 3  | 6  | 1 | 0.500000 | 0.409091 |
| 12 | 3  | 6  | 2 | 0.909091 | 0.409091 |
| 12 | 3  | 6  | 3 | 1.000000 | 0.090909 |
| 12 | 3  | 7  | 0 | 0.045455 | 0.045455 |
| 12 | 3  | 7  | 1 | 0.363636 | 0.318182 |
| 12 | 3  | 7  | 2 | 0.840909 | 0.477273 |
| 12 | 3  | 7  | 3 | 1.000000 | 0.159091 |
| 12 | 3  | 8  | 0 | 0.018182 | 0.018182 |
| 12 | 3  | 8  | 1 | 0.236364 | 0.218182 |
| 12 | 3  | 8  | 2 | 0.745455 | 0.509091 |
| 12 | 3  | 8  | 3 | 1.000000 | 0.254545 |
| 12 | 3  | 9  | 0 | 0.004545 | 0.004545 |
| 12 | 3  | 9  | 1 | 0.127273 | 0.122727 |
| 12 | 3  | 9  | 2 | 0.618182 | 0.490909 |
| 12 | 3  | 9  | 3 | 1.000000 | 0.381818 |
| 12 | 3  | 10 | 1 | 0.045455 | 0.045455 |
| 12 | 3  | 10 | 2 | 0.454545 | 0.409091 |
| 12 | 3  | 10 | 3 | 1.000000 | 0.545455 |
| 12 | 3  | 11 | 2 | 0.250000 | 0.250000 |
| 12 | 3  | 11 | 3 | 1.000000 | 0.750000 |
| 12 | 3  | 12 | 3 | 1.000000 | 1.000000 |
| 12 | 4  | 1  | 0 | 0.666667 | 0.666667 |

| N  | NS | K  | X | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|
| 12 | 4  | 1  | 1 | 1.000000 | 0.333333 |
| 12 | 4  | 2  | 0 | 0.424242 | 0.424242 |
| 12 | 4  | 2  | 1 | 0.909091 | 0.484848 |
| 12 | 4  | 2  | 2 | 1.000000 | 0.090909 |
| 12 | 4  | 3  | 0 | 0.254545 | 0.254545 |
| 12 | 4  | 3  | 1 | 0.763636 | 0.509091 |
| 12 | 4  | 3  | 2 | 0.981818 | 0.218182 |
| 12 | 4  | 3  | 3 | 1.000000 | 0.018182 |
| 12 | 4  | 4  | 0 | 0.141414 | 0.141414 |
| 12 | 4  | 4  | 1 | 0.593939 | 0.452525 |
| 12 | 4  | 4  | 2 | 0.933333 | 0.339394 |
| 12 | 4  | 4  | 3 | 0.997980 | 0.064646 |
| 12 | 4  | 4  | 4 | 1.000000 | 0.002020 |
| 12 | 4  | 5  | 0 | 0.070707 | 0.070707 |
| 12 | 4  | 5  | 1 | 0.424242 | 0.353535 |
| 12 | 4  | 5  | 2 | 0.848485 | 0.424242 |
| 12 | 4  | 5  | 3 | 0.989899 | 0.141414 |
| 12 | 4  | 5  | 4 | 1.000000 | 0.010101 |
| 12 | 4  | 6  | 0 | 0.030303 | 0.030303 |
| 12 | 4  | 6  | 1 | 0.272727 | 0.242424 |
| 12 | 4  | 6  | 2 | 0.727273 | 0.454545 |
| 12 | 4  | 6  | 3 | 0.969697 | 0.242424 |
| 12 | 4  | 6  | 4 | 1.000000 | 0.030303 |
| 12 | 4  | 7  | 0 | 0.010101 | 0.010101 |
| 12 | 4  | 7  | 1 | 0.151515 | 0.141414 |
| 12 | 4  | 7  | 2 | 0.575758 | 0.424242 |
| 12 | 4  | 7  | 3 | 0.929293 | 0.353535 |
| 12 | 4  | 7  | 4 | 1.000000 | 0.070707 |
| 12 | 4  | 8  | 0 | 0.002020 | 0.002020 |
| 12 | 4  | 8  | 1 | 0.066667 | 0.064646 |
| 12 | 4  | 8  | 2 | 0.406061 | 0.339394 |
| 12 | 4  | 8  | 3 | 0.858586 | 0.452525 |
| 12 | 4  | 8  | 4 | 1.000000 | 0.141414 |
| 12 | 4  | 9  | 1 | 0.018182 | 0.018182 |
| 12 | 4  | 9  | 2 | 0.236364 | 0.218182 |
| 12 | 4  | 9  | 3 | 0.745455 | 0.509091 |
| 12 | 4  | 9  | 4 | 1.000000 | 0.254545 |
| 12 | 4  | 10 | 2 | 0.090909 | 0.090909 |
| 12 | 4  | 10 | 3 | 0.575758 | 0.484848 |
| 12 | 4  | 10 | 4 | 1.000000 | 0.424242 |
| 12 | 4  | 11 | 3 | 0.333333 | 0.333333 |
| 12 | 4  | 11 | 4 | 1.000000 | 0.666667 |
| 12 | 4  | 12 | 4 | 1.000000 | 1.000000 |
| 12 | 5  | 1  | 0 | 0.583333 | 0.583333 |
| 12 | 5  | 1  | 1 | 1.000000 | 0.416667 |
| 12 | 5  | 2  | 0 | 0.318182 | 0.318182 |
| 12 | 5  | 2  | 1 | 0.848485 | 0.530303 |
| 12 | 5  | 2  | 2 | 1.000000 | 0.151515 |
| 12 | 5  | 3  | 0 | 0.159091 | 0.159091 |
| 12 | 5  | 3  | 1 | 0.636364 | 0.477273 |

| N  | NS | K  | X | P(<=X)   | P(=X)    | N  | NS | K  | X | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|----|----|----|---|----------|----------|
| 12 | 5  | 3  | 2 | 0.954545 | 0.318182 | 12 | 6  | 4  | 1 | 0.272727 | 0.242424 |
| 12 | 5  | 3  | 3 | 1.000000 | 0.045455 | 12 | 6  | 4  | 2 | 0.727273 | 0.454545 |
| 12 | 5  | 4  | 0 | 0.070707 | 0.070707 | 12 | 6  | 4  | 3 | 0.969697 | 0.242424 |
| 12 | 5  | 4  | 1 | 0.424242 | 0.353535 | 12 | 6  | 4  | 4 | 1.000000 | 0.030303 |
| 12 | 5  | 4  | 2 | 0.848485 | 0.424242 | 12 | 6  | 5  | 0 | 0.007576 | 0.007576 |
| 12 | 5  | 4  | 3 | 0.989899 | 0.141414 | 12 | 6  | 5  | 1 | 0.121212 | 0.113636 |
| 12 | 5  | 4  | 4 | 1.000000 | 0.010101 | 12 | 6  | 5  | 2 | 0.500000 | 0.378788 |
| 12 | 5  | 5  | 0 | 0.026515 | 0.026515 | 12 | 6  | 5  | 3 | 0.878788 | 0.378788 |
| 12 | 5  | 5  | 1 | 0.247475 | 0.220960 | 12 | 6  | 5  | 4 | 0.992424 | 0.113636 |
| 12 | 5  | 5  | 2 | 0.689394 | 0.441919 | 12 | 6  | 5  | 5 | 1.000000 | 0.007576 |
| 12 | 5  | 5  | 3 | 0.954545 | 0.265152 | 12 | 6  | 6  | 0 | 0.001082 | 0.001082 |
| 12 | 5  | 5  | 4 | 0.998737 | 0.044192 | 12 | 6  | 6  | 1 | 0.040043 | 0.038961 |
| 12 | 5  | 5  | 5 | 1.000000 | 0.001263 | 12 | 6  | 6  | 2 | 0.283550 | 0.243506 |
| 12 | 5  | 6  | 0 | 0.007576 | 0.007576 | 12 | 6  | 6  | 3 | 0.716450 | 0.432900 |
| 12 | 5  | 6  | 1 | 0.121212 | 0.113636 | 12 | 6  | 6  | 4 | 0.959957 | 0.243506 |
| 12 | 5  | 6  | 2 | 0.500000 | 0.378788 | 12 | 6  | 6  | 5 | 0.998918 | 0.038961 |
| 12 | 5  | 6  | 3 | 0.878788 | 0.378788 | 12 | 6  | 6  | 6 | 1.000000 | 0.001082 |
| 12 | 5  | 6  | 4 | 0.992424 | 0.113636 | 12 | 6  | 7  | 1 | 0.007576 | 0.007576 |
| 12 | 5  | 6  | 5 | 1.000000 | 0.007576 | 12 | 6  | 7  | 2 | 0.121212 | 0.113636 |
| 12 | 5  | 7  | 0 | 0.001263 | 0.001263 | 12 | 6  | 7  | 3 | 0.500000 | 0.378788 |
| 12 | 5  | 7  | 1 | 0.045455 | 0.044192 | 12 | 6  | 7  | 4 | 0.878788 | 0.378788 |
| 12 | 5  | 7  | 2 | 0.310606 | 0.265152 | 12 | 6  | 7  | 5 | 0.992424 | 0.113636 |
| 12 | 5  | 7  | 3 | 0.752525 | 0.441919 | 12 | 6  | 7  | 6 | 1.000000 | 0.007576 |
| 12 | 5  | 7  | 4 | 0.973485 | 0.220960 | 12 | 6  | 8  | 2 | 0.030303 | 0.030303 |
| 12 | 5  | 7  | 5 | 1.000000 | 0.026515 | 12 | 6  | 8  | 3 | 0.272727 | 0.242424 |
| 12 | 5  | 8  | 1 | 0.010101 | 0.010101 | 12 | 6  | 8  | 4 | 0.727273 | 0.454545 |
| 12 | 5  | 8  | 2 | 0.151515 | 0.141414 | 12 | 6  | 8  | 5 | 0.969697 | 0.242424 |
| 12 | 5  | 8  | 3 | 0.575758 | 0.424242 | 12 | 6  | 8  | 6 | 1.000000 | 0.030303 |
| 12 | 5  | 8  | 4 | 0.929293 | 0.353535 | 12 | 6  | 9  | 3 | 0.090909 | 0.090909 |
| 12 | 5  | 8  | 5 | 1.000000 | 0.070707 | 12 | 6  | 9  | 4 | 0.500000 | 0.409091 |
| 12 | 5  | 9  | 2 | 0.045455 | 0.045455 | 12 | 6  | 9  | 5 | 0.909091 | 0.409091 |
| 12 | 5  | 9  | 3 | 0.363636 | 0.318182 | 12 | 6  | 9  | 6 | 1.000000 | 0.090909 |
| 12 | 5  | 9  | 4 | 0.840909 | 0.477273 | 12 | 6  | 10 | 4 | 0.227273 | 0.227273 |
| 12 | 5  | 9  | 5 | 1.000000 | 0.159091 | 12 | 6  | 10 | 5 | 0.772727 | 0.545455 |
| 12 | 5  | 10 | 3 | 0.151515 | 0.151515 | 12 | 6  | 10 | 6 | 1.000000 | 0.227273 |
| 12 | 5  | 10 | 4 | 0.681818 | 0.530303 | 12 | 6  | 11 | 5 | 0.500000 | 0.500000 |
| 12 | 5  | 10 | 5 | 1.000000 | 0.318182 | 12 | 6  | 11 | 6 | 1.000000 | 0.500000 |
| 12 | 5  | 11 | 4 | 0.416667 | 0.416667 | 12 | 6  | 12 | 6 | 1.000000 | 1.000000 |
| 12 | 5  | 11 | 5 | 1.000000 | 0.583333 | 12 | 7  | 1  | 0 | 0.416667 | 0.416667 |
| 12 | 5  | 12 | 5 | 1.000000 | 1.000000 | 12 | 7  | 1  | 1 | 1.000000 | 0.583333 |
| 12 | 6  | 1  | 0 | 0.500000 | 0.500000 | 12 | 7  | 2  | 0 | 0.151515 | 0.151515 |
| 12 | 6  | 1  | 1 | 1.000000 | 0.500000 | 12 | 7  | 2  | 1 | 0.681818 | 0.530303 |
| 12 | 6  | 2  | 0 | 0.227273 | 0.227273 | 12 | 7  | 2  | 2 | 1.000000 | 0.318182 |
| 12 | 6  | 2  | 1 | 0.772727 | 0.545455 | 12 | 7  | 3  | 0 | 0.045455 | 0.045455 |
| 12 | 6  | 2  | 2 | 1.000000 | 0.227273 | 12 | 7  | 3  | 1 | 0.363636 | 0.318182 |
| 12 | 6  | 3  | 0 | 0.090909 | 0.090909 | 12 | 7  | 3  | 2 | 0.840909 | 0.477273 |
| 12 | 6  | 3  | 1 | 0.500000 | 0.409091 | 12 | 7  | 3  | 3 | 1.000000 | 0.159091 |
| 12 | 6  | 3  | 2 | 0.909091 | 0.409091 | 12 | 7  | 4  | 0 | 0.010101 | 0.010101 |
| 12 | 6  | 3  | 3 | 1.000000 | 0.090909 | 12 | 7  | 4  | 1 | 0.151515 | 0.141414 |
| 12 | 6  | 4  | 0 | 0.030303 | 0.030303 | 12 | 7  | 4  | 2 | 0.575758 | 0.424242 |

| N  | NS | K  | X | P(<=X)   | P(=X)    | N  | NS | K  | X | P(<=X)   | P(=X)    |
|----|----|----|---|----------|----------|----|----|----|---|----------|----------|
| 12 | 7  | 4  | 3 | 0.929293 | 0.353535 | 12 | 8  | 5  | 2 | 0.151515 | 0.141414 |
| 12 | 7  | 4  | 4 | 1.000000 | 0.070707 | 12 | 8  | 5  | 3 | 0.575758 | 0.424242 |
| 12 | 7  | 5  | 0 | 0.001263 | 0.001263 | 12 | 8  | 5  | 4 | 0.929293 | 0.353535 |
| 12 | 7  | 5  | 1 | 0.045455 | 0.044192 | 12 | 8  | 5  | 5 | 1.000000 | 0.070707 |
| 12 | 7  | 5  | 2 | 0.310606 | 0.265152 | 12 | 8  | 6  | 2 | 0.030303 | 0.030303 |
| 12 | 7  | 5  | 3 | 0.752525 | 0.441919 | 12 | 8  | 6  | 3 | 0.272727 | 0.242424 |
| 12 | 7  | 5  | 4 | 0.973485 | 0.220960 | 12 | 8  | 6  | 4 | 0.727273 | 0.454545 |
| 12 | 7  | 5  | 5 | 1.000000 | 0.026515 | 12 | 8  | 6  | 5 | 0.969697 | 0.242424 |
| 12 | 7  | 6  | 1 | 0.007576 | 0.007576 | 12 | 8  | 6  | 6 | 1.000000 | 0.030303 |
| 12 | 7  | 6  | 2 | 0.121212 | 0.113636 | 12 | 8  | 7  | 3 | 0.070707 | 0.070707 |
| 12 | 7  | 6  | 3 | 0.500000 | 0.378788 | 12 | 8  | 7  | 4 | 0.424242 | 0.353535 |
| 12 | 7  | 6  | 4 | 0.878788 | 0.378788 | 12 | 8  | 7  | 5 | 0.848485 | 0.424242 |
| 12 | 7  | 6  | 5 | 0.992424 | 0.113636 | 12 | 8  | 7  | 6 | 0.989899 | 0.141414 |
| 12 | 7  | 6  | 6 | 1.000000 | 0.007576 | 12 | 8  | 7  | 7 | 1.000000 | 0.010101 |
| 12 | 7  | 7  | 2 | 0.026515 | 0.026515 | 12 | 8  | 8  | 4 | 0.141414 | 0.141414 |
| 12 | 7  | 7  | 3 | 0.247475 | 0.220960 | 12 | 8  | 8  | 5 | 0.593939 | 0.452525 |
| 12 | 7  | 7  | 4 | 0.689394 | 0.441919 | 12 | 8  | 8  | 6 | 0.933333 | 0.339394 |
| 12 | 7  | 7  | 5 | 0.954545 | 0.265152 | 12 | 8  | 8  | 7 | 0.997980 | 0.064646 |
| 12 | 7  | 7  | 6 | 0.998737 | 0.044192 | 12 | 8  | 8  | 8 | 1.000000 | 0.002020 |
| 12 | 7  | 7  | 7 | 1.000000 | 0.001263 | 12 | 8  | 9  | 5 | 0.254545 | 0.254545 |
| 12 | 7  | 8  | 3 | 0.070707 | 0.070707 | 12 | 8  | 9  | 6 | 0.763636 | 0.509091 |
| 12 | 7  | 8  | 4 | 0.424242 | 0.353535 | 12 | 8  | 9  | 7 | 0.981818 | 0.218182 |
| 12 | 7  | 8  | 5 | 0.848485 | 0.424242 | 12 | 8  | 9  | 8 | 1.000000 | 0.018182 |
| 12 | 7  | 8  | 6 | 0.989899 | 0.141414 | 12 | 8  | 10 | 6 | 0.424242 | 0.424242 |
| 12 | 7  | 8  | 7 | 1.000000 | 0.010101 | 12 | 8  | 10 | 7 | 0.909091 | 0.484848 |
| 12 | 7  | 9  | 4 | 0.159091 | 0.159091 | 12 | 8  | 10 | 8 | 1.000000 | 0.090909 |
| 12 | 7  | 9  | 5 | 0.636364 | 0.477273 | 12 | 8  | 11 | 7 | 0.666667 | 0.666667 |
| 12 | 7  | 9  | 6 | 0.954545 | 0.318182 | 12 | 8  | 11 | 8 | 1.000000 | 0.333333 |
| 12 | 7  | 9  | 7 | 1.000000 | 0.045455 | 12 | 8  | 12 | 8 | 1.000000 | 1.000000 |
| 12 | 7  | 10 | 5 | 0.318182 | 0.318182 | 12 | 9  | 1  | 0 | 0.250000 | 0.250000 |
| 12 | 7  | 10 | 6 | 0.848485 | 0.530303 | 12 | 9  | 1  | 1 | 1.000000 | 0.750000 |
| 12 | 7  | 10 | 7 | 1.000000 | 0.151515 | 12 | 9  | 2  | 0 | 0.045455 | 0.045455 |
| 12 | 7  | 11 | 6 | 0.583333 | 0.583333 | 12 | 9  | 2  | 1 | 0.454545 | 0.409091 |
| 12 | 7  | 11 | 7 | 1.000000 | 0.416667 | 12 | 9  | 2  | 2 | 1.000000 | 0.545455 |
| 12 | 7  | 12 | 7 | 1.000000 | 1.000000 | 12 | 9  | 3  | 0 | 0.004545 | 0.004545 |
| 12 | 8  | 1  | 0 | 0.333333 | 0.333333 | 12 | 9  | 3  | 1 | 0.127273 | 0.122727 |
| 12 | 8  | 1  | 1 | 1.000000 | 0.666667 | 12 | 9  | 3  | 2 | 0.618182 | 0.490909 |
| 12 | 8  | 2  | 0 | 0.090909 | 0.090909 | 12 | 9  | 3  | 3 | 1.000000 | 0.381818 |
| 12 | 8  | 2  | 1 | 0.575758 | 0.484848 | 12 | 9  | 4  | 1 | 0.018182 | 0.018182 |
| 12 | 8  | 2  | 2 | 1.000000 | 0.424242 | 12 | 9  | 4  | 2 | 0.236364 | 0.218182 |
| 12 | 8  | 3  | 0 | 0.018182 | 0.018182 | 12 | 9  | 4  | 3 | 0.745455 | 0.509091 |
| 12 | 8  | 3  | 1 | 0.236364 | 0.218182 | 12 | 9  | 4  | 4 | 1.000000 | 0.254545 |
| 12 | 8  | 3  | 2 | 0.745455 | 0.509091 | 12 | 9  | 5  | 2 | 0.045455 | 0.045455 |
| 12 | 8  | 3  | 3 | 1.000000 | 0.254545 | 12 | 9  | 5  | 3 | 0.363636 | 0.318182 |
| 12 | 8  | 4  | 0 | 0.002020 | 0.002020 | 12 | 9  | 5  | 4 | 0.840909 | 0.477273 |
| 12 | 8  | 4  | 1 | 0.066667 | 0.064646 | 12 | 9  | 5  | 5 | 1.000000 | 0.159091 |
| 12 | 8  | 4  | 2 | 0.406061 | 0.339394 | 12 | 9  | 6  | 3 | 0.090909 | 0.090909 |
| 12 | 8  | 4  | 3 | 0.858586 | 0.452525 | 12 | 9  | 6  | 4 | 0.500000 | 0.409091 |
| 12 | 8  | 4  | 4 | 1.000000 | 0.141414 | 12 | 9  | 6  | 5 | 0.909091 | 0.409091 |
| 12 | 8  | 5  | 1 | 0.010101 | 0.010101 | 12 | 9  | 6  | 6 | 1.000000 | 0.090909 |



| N  | NS | K  | X  | P(<=X)   | P(=X)    | N  | NS | K  | X  | P(<=X)   | P(=X)    |
|----|----|----|----|----------|----------|----|----|----|----|----------|----------|
| 12 | 9  | 7  | 4  | 0.159091 | 0.159091 | 12 | 11 | 1  | 0  | 0.083333 | 0.083333 |
| 12 | 9  | 7  | 5  | 0.636364 | 0.477273 | 12 | 11 | 1  | 1  | 1.000000 | 0.916667 |
| 12 | 9  | 7  | 6  | 0.954545 | 0.318182 | 12 | 11 | 2  | 1  | 0.166667 | 0.166667 |
| 12 | 9  | 7  | 7  | 1.000000 | 0.045455 | 12 | 11 | 2  | 2  | 1.000000 | 0.833333 |
| 12 | 9  | 8  | 5  | 0.254545 | 0.254545 | 12 | 11 | 3  | 2  | 0.250000 | 0.250000 |
| 12 | 9  | 8  | 6  | 0.763636 | 0.509091 | 12 | 11 | 3  | 3  | 1.000000 | 0.750000 |
| 12 | 9  | 8  | 7  | 0.981818 | 0.218182 | 12 | 11 | 4  | 3  | 0.333333 | 0.333333 |
| 12 | 9  | 8  | 8  | 1.000000 | 0.018182 | 12 | 11 | 4  | 4  | 1.000000 | 0.666667 |
| 12 | 9  | 9  | 6  | 0.381818 | 0.381818 | 12 | 11 | 5  | 4  | 0.416667 | 0.416667 |
| 12 | 9  | 9  | 7  | 0.872727 | 0.490909 | 12 | 11 | 5  | 5  | 1.000000 | 0.583333 |
| 12 | 9  | 9  | 8  | 0.995455 | 0.122727 | 12 | 11 | 6  | 5  | 0.500000 | 0.500000 |
| 12 | 9  | 9  | 9  | 1.000000 | 0.004545 | 12 | 11 | 6  | 6  | 1.000000 | 0.500000 |
| 12 | 9  | 10 | 7  | 0.545455 | 0.545455 | 12 | 11 | 7  | 6  | 0.583333 | 0.583333 |
| 12 | 9  | 10 | 8  | 0.954545 | 0.409091 | 12 | 11 | 7  | 7  | 1.000000 | 0.416667 |
| 12 | 9  | 10 | 9  | 1.000000 | 0.045455 | 12 | 11 | 8  | 7  | 0.666667 | 0.666667 |
| 12 | 9  | 11 | 8  | 0.750000 | 0.750000 | 12 | 11 | 8  | 8  | 1.000000 | 0.333333 |
| 12 | 9  | 11 | 9  | 1.000000 | 0.250000 | 12 | 11 | 9  | 8  | 0.750000 | 0.750000 |
| 12 | 9  | 12 | 9  | 1.000000 | 1.000000 | 12 | 11 | 9  | 9  | 1.000000 | 0.250000 |
| 12 | 10 | 1  | 0  | 0.166667 | 0.166667 | 12 | 11 | 10 | 9  | 0.833333 | 0.833333 |
| 12 | 10 | 1  | 1  | 1.000000 | 0.833333 | 12 | 11 | 10 | 10 | 1.000000 | 0.166667 |
| 12 | 10 | 2  | 0  | 0.015152 | 0.015152 | 12 | 11 | 11 | 10 | 0.916667 | 0.916667 |
| 12 | 10 | 2  | 1  | 0.318182 | 0.303030 | 12 | 11 | 11 | 11 | 1.000000 | 0.083333 |
| 12 | 10 | 2  | 2  | 1.000000 | 0.681818 | 12 | 11 | 12 | 11 | 1.000000 | 1.000000 |
| 12 | 10 | 3  | 1  | 0.045455 | 0.045455 |    |    |    |    |          |          |
| 12 | 10 | 3  | 2  | 0.454545 | 0.409091 |    |    |    |    |          |          |
| 12 | 10 | 3  | 3  | 1.000000 | 0.545455 |    |    |    |    |          |          |
| 12 | 10 | 4  | 2  | 0.090909 | 0.090909 |    |    |    |    |          |          |
| 12 | 10 | 4  | 3  | 0.575758 | 0.484848 |    |    |    |    |          |          |
| 12 | 10 | 4  | 4  | 1.000000 | 0.424242 |    |    |    |    |          |          |
| 12 | 10 | 5  | 3  | 0.151515 | 0.151515 |    |    |    |    |          |          |
| 12 | 10 | 5  | 4  | 0.681818 | 0.530303 |    |    |    |    |          |          |
| 12 | 10 | 5  | 5  | 1.000000 | 0.318182 |    |    |    |    |          |          |
| 12 | 10 | 6  | 4  | 0.227273 | 0.227273 |    |    |    |    |          |          |
| 12 | 10 | 6  | 5  | 0.772727 | 0.545455 |    |    |    |    |          |          |
| 12 | 10 | 6  | 6  | 1.000000 | 0.227273 |    |    |    |    |          |          |
| 12 | 10 | 7  | 5  | 0.318182 | 0.318182 |    |    |    |    |          |          |
| 12 | 10 | 7  | 6  | 0.848485 | 0.530303 |    |    |    |    |          |          |
| 12 | 10 | 7  | 7  | 1.000000 | 0.151515 |    |    |    |    |          |          |
| 12 | 10 | 8  | 6  | 0.424242 | 0.424242 |    |    |    |    |          |          |
| 12 | 10 | 8  | 7  | 0.909091 | 0.484848 |    |    |    |    |          |          |
| 12 | 10 | 8  | 8  | 1.000000 | 0.090909 |    |    |    |    |          |          |
| 12 | 10 | 9  | 7  | 0.545455 | 0.545455 |    |    |    |    |          |          |
| 12 | 10 | 9  | 8  | 0.954545 | 0.409091 |    |    |    |    |          |          |
| 12 | 10 | 9  | 9  | 1.000000 | 0.045455 |    |    |    |    |          |          |
| 12 | 10 | 10 | 8  | 0.681818 | 0.681818 |    |    |    |    |          |          |
| 12 | 10 | 10 | 9  | 0.984848 | 0.303030 |    |    |    |    |          |          |
| 12 | 10 | 10 | 10 | 1.000000 | 0.015152 |    |    |    |    |          |          |
| 12 | 10 | 11 | 9  | 0.833333 | 0.833333 |    |    |    |    |          |          |
| 12 | 10 | 11 | 10 | 1.000000 | 0.166667 |    |    |    |    |          |          |
| 12 | 10 | 12 | 10 | 1.000000 | 1.000000 |    |    |    |    |          |          |