SRS Process Facility Significance Fire Frequency

by

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SRS PROCESS FACILITY SIGNIFICANT FIRE FREQUENCY (U)

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SRS PROCESS FACILITY SIGNIFICANT FIRE FREQUENCY (U)

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ABSTRACT:

Accidents caused by fire are analyzed for each SRS facility Safety Analysis Report. These analyses are based on an initiation frequency and the probability that mitigative systems or actions will control the fire. Because SRS process facilities are designed similarly (from a fire protection point of view), and use similar fire prevention and mitigation procedures, it is reasonable to develop a site generic process facility significant fire initiator frequency, and apply it to all SRS process facilities.

This report documents the method and assumptions of a study performed to determine a site generic process facility significant fire initiator frequency and explains the proper way this value should be used.

1.0 INTRODUCTION

Risk analysis is used to determine the risk due to fire for a given facility. The risk of a fire is defined as the expected frequency of a fire multiplied by the consequence of that fire. Because the frequency of fires (any size) within a facility is fairly high (on the order of 1 per year), and the potential consequences range from insignificant to full facility loss, fire accidents are grouped by severity, and each case is evaluated separately. The facility fire risk is the sum of each fire group risk.

According to SRS historical data (Reference 1), the majority of process facility fires are detected early and extinguished before significant damage occurs. These fires are typically self-extinguishing or are extinguished by facility occupants with fire extinguishers. These events have no significant consequence and need not be included in the fire initiator frequency when performing fire risk calculations. Similarly, fires that are controlled by the fire department using only hand-held fire extinguishers occur fairly regularly (once every few years for an average process facility), but have no consequences, and are not included as significant fires.

The purpose of this report is to document the results of a study that determines the frequency of significant fires in SRS process facilities, based on recent historical SRS process facility fire data. SRS process facilities are facilities identified in Table 1. Significant fires are defined as fires that challenge an automatic suppression system, or are extinguished by the fire department, using more than hand-held fire extinguishers.

2.0 METHOD

2.1 Assumptions and Definitions

1. "Recent, significant, process facility fire events" are fires reported in the SRS data base (Reference 1) with the following characteristics:
 - a. Occurred between 1/1/75 and 9/20/95
 - b. Occurred inside of a process facility listed in Table 1
 - c. Extinguished by automatic suppression system or by the fire department, using more than hand-held fire extinguishers.
2. Fire frequencies for process facilities prior to 1975 may not reflect current conditions and are not included in this calculation.
3. Fire frequencies in facilities that are in "shutdown" may not reflect fire frequencies of operating process facilities and are not included in this calculation.
4. Fire frequencies of testing facilities (T-area facilities) may not reflect fire frequencies of process facilities and are not included in this calculation.

2.2 Input Data

1. SRS fire event data base (Reference 1)
2. List of all SRS facilities, sizes, years of operation (Reference 2)
3. List of SRS process facilities (Table 1)

2.3 Analytical Methods and Computations

An outline of the steps taken to determine the frequency of SRS process facility fires, followed by a detailed description of each step follows:

Outline

1. Compile list of all SRS facilities of interest (process facilities)
 - a. Use *Benefit vs Cost Evaluation* document (Reference 2) as starting point (includes all facilities, as of 1990)
 - b. Delete all non-process facilities (using list of process facilities in Table 1)
 - c. Add new process facilities (ones started since 1990)
2. Compile list of fires in process facilities
 - a. Start with site fire database (Reference 1) on Filemaker Pro (includes all SRS fire events, from 1958 to present)
 - b. Download to Microsoft Word
 - c. Sort by date, and delete events prior to 1975
 - d. Sort by building numbers, and delete all entries that are not process facilities
 - e. Delete entries that are entered as process facilities but are described within the entry as not really within facility (delete fires near facilities)
3. Categorize fires into "controlled" or "significant fire event."
4. Create spreadsheet of process facilities, histories, calculated frequencies
 - a. Enter facilities from item 1 above.
 - b. Add total floor space for each facility
 - c. Enter applicable operating years for each facility
 - d. Enter number of significant fires for each facility
 - e. Calculate facility "area-years" for each facility
 - f. Calculate the significant fire frequency

Details of each step

- 1a. Get a list of all SRS facilities (including sizes) from the 1992 Benefit vs Cost Evaluation document (Reference 2). This document reflects data from 1958 through 1990.
- 1b. Delete facilities that are not process facilities. The objective of this calculation is to document a fire frequency for process facilities. There is adequate volume of data from SRS process facilities making it is unnecessary to include non-process facilities, which may have dissimilar fire initiation frequencies. TNX is deleted because the type of operations in those facilities is more testing and less production, which may experience significantly different fire initiation frequencies.
- 1c. Add process facilities that are not included in Reference 2. RTF has been added to this table because it has begun radioactive operations since Reference 2 was issued. DWPF and CIF are left out, since they have not yet accumulated appropriate operational data.

The resulting facility list is presented in column 1 of Table 1.

- 2a. Copy the current version of SRS fire events, as of 9-20-95 (Reference 1). This data base is maintained by the Criticality & Fire Analysis Section (C&FAS) of the Engineering & Construction Services Division (E&CSD). At the time that the data base was copied for this calculation, 1,227 SRS fire events were included.
- 2b. The data base (a File Maker Pro file) allows data to be downloaded to a Microsoft Word file. The following fields were included in the transfer of data base information into Microsoft Word:
 - Date - Date of the event
 - Building - Building that fire affected
 - Area - Area of SRS where fire occurred
 - Description - Description of fire progression, usually including the cause, the extent of damage, and the method of extinguishment.
- 2c. Once SRS fire event data is in Microsoft Word, the file is sorted by the "date" column. All rows (events) prior to 1/1/75 are deleted. This is because recent operational data is expected to be more representative of future experience than older data. There is no specific reason for choosing 1975 as a starting point. The objective is to eliminate older data without deleting so much that there are not enough significant events to remain statistically accurate.
- 2d. Re-sort the table, this time using the "building" column. All rows (events) under facilities that are not included in Table 1 are deleted. This removes fire events that are in office buildings, warehouses, storage buildings, trailers, and other facilities that are not similar to typical process facilities.
- 2e. Read descriptions of each remaining event. Delete rows (events) that are described as being outside the facility. Some of these events are vehicle fires (in vehicles parked near a process facility) or in dumpsters outside the facility.

Following step 2, the remaining events are recent process facility fires. These events are presented in Appendix 1.

3. Categorize Appendix 1 fire events into "controlled" or "significant fire event." Identify as "controlled" if fire was self-extinguished, extinguished by facility worker, or extinguished by fire department using fire extinguisher. Identify as "significant fire event" if fire was extinguished by automatic suppression system, or if it was extinguished by the fire department, using more than hand held fire extinguishers.

Following step 3, the remaining events are significant, recent process facility fires. These events are presented in Appendix 2. (This is a subset of Appendix 1.)

- 4a. Using the list of process facilities in Table 1, create a list of process facilities in a column of an Excel spreadsheet. This list may include some facilities not in the fire data base because some facilities may have no recorded fire events (such as RTF).
- 4b. From Reference 2, enter the approximate square footage of each facility in the second column. Use of these values assumes that fire frequency in a given facility is proportional to the floor area of that facility. It is not critical that these numbers be exact, only that they are the right order of magnitude. It is conservative to under estimate the size of facilities for this part of the calculation.
- 4c. In the third and fourth columns enter each facility's startup date (or 1/1/75 if started earlier than that) and shutdown date (or 9/20/95, if the facility is still operating). Use the next column to calculate the years of operation. The years of operation are necessary to convert the number of fires to a frequency.
- 4d. Using the data from step 3 above, enter the number of significant fire events for each facility in column 7. It is not expected that there will be very many of these events, because as stated earlier, most fires at SRS have been extinguished by facility occupants or fire department personnel while the fire is still in the incipient or early growth stage.
- 4e. Calculate facility "area-years" for each facility by using column 8, entering the product of column 2 (facility square footage) and column 5 (facility years of operation). The sum of all facility "area-years" is calculated by adding all entries in column 8.
- 4f. Calculate the average SRS process facility significant fire event frequency by dividing the total number of significant fires by the sum of facility "area-years" (from step 4e). This is the site generic value for significant fires in process facilities at SRS (per year, per square foot).

The result of step 4f is the value of interest for this calculation. This number represents the frequency at which a fire is expected (per square foot) in an SRS process facility, such as RTF, reactors, DWPF, or the separation facilities.

Table 1

SRS Process Facility Sizes, Years of Operation, and # of Significant Fires

BLDG	SQ FT	Date started	Date Shutdown	Years of operation	Area-years of operation	Significant fires
105-C	500,000	01/01/75	12/01/88	13.9	7.0E+06	0
105-K	500,000	01/01/75	12/01/88	13.9	7.0E+06	0
105-L	500,000	10/01/85	12/01/88	3.2	1.6E+06	0
105-P	750,000	01/01/75	12/01/88	13.9	1.0E+07	0
108-1C	6,000	01/01/75	12/01/88	13.9	8.4E+04	0
108-1L	6,000	10/01/85	12/01/88	3.2	1.9E+04	0
108-1P	6,000	01/01/75	12/01/88	13.9	8.4E+04	0
108-2C	6,000	01/01/75	12/01/88	13.9	8.4E+04	0
108-2K	6,000	01/01/75	12/01/88	13.9	8.4E+04	0
108-2L	6,625	10/01/85	12/01/88	3.2	2.1E+04	0
108-2P	6,000	01/01/75	12/01/88	13.9	8.4E+04	0
221-1F	24,067	01/01/75	09/20/95	20.7	5.0E+05	0
221-F	329,600	01/01/75	09/20/95	20.7	6.8E+06	3
221-H	329,600	01/01/75	09/20/95	20.7	6.8E+06	1
232-1H	11,000	01/01/75	09/20/95	20.7	2.3E+05	0
232-F	16,440	01/01/75	09/20/95	20.7	3.4E+05	0
232-H	55,220	01/01/75	09/20/95	20.7	1.1E+06	0
233-H	40,000	01/01/94	09/20/95	1.7	6.9E+04	0
234-H	45,737	01/01/75	09/20/95	20.7	9.5E+05	0
235-F	47,080	09/01/84	09/20/95	11.1	5.2E+05	1
235-H	12,000	01/01/75	09/20/95	20.7	2.5E+05	0
247-F	140,000	07/01/88	09/20/90	2.2	3.1E+05	0
313-M	57,212	01/01/75	09/20/95	20.7	1.2E+06	0
320-M	63,288	01/01/75	09/20/95	20.7	1.3E+06	1
321-M	56,072	01/01/75	09/20/95	20.7	1.2E+06	1
773-A	304,000	01/01/75	09/20/95	20.7	6.3E+06	1 ^{*1}
Totals	NA	NA	NA	NA	5.4E+07	8

*1 Note that two events that occurred in 773-A were deleted (as shown by ~~strikethrough~~ lettering in Appendix 2), based on being welding events. It is believed that these events would have been controlled by a facility employee, if no automatic suppression system or fire department response were provided.

SRS process facility significant fire frequency
= 8 fires / 5.4×10^7 ft² years
= 1.5×10^{-7} fires per ft² per year

2.4 Results and Conclusion

Analysis of recent SRS fire historical data leads the conclusion that significant fires in SRS process facilities occur at a rate of 1.5×10^{-7} per ft² per year. This value is multiplied by the size (square footage) of the process facility of interest to give the expected frequency of significant fire events for that facility. Examples of facilities, sizes, and corresponding fire frequencies follow:

<u>Facility</u>	<u>Facility Size (ft.²)</u>	<u>Expected Fire Frequency (per year)</u>
233-H	40,000	6×10^{-3}
234-H	45,800	7×10^{-3}
221-S	192,000	3×10^{-2}

When using the significant process facility fire frequency value for facility fire risk calculations, caution must be used to ensure that additional credit is not given to facility response or fire department response to small fires because these mitigating factors are inherently credited within the derivation of this number. In addition, if a process facility plans to operate with less procedural controls that prevent or mitigate fires than have been used in the past, this value may not be valid.

3.0 REFERENCES

1. MD Brandyberry, *Analysis of SRS Fire Records (U)*, WSRC-RP-90-143, Revision 0, March 12, 1990.

Note: Reference 1 was developed in 1990 and is maintained current by the Fire Protection group of E&CSD, based on monthly fire reports.

2. HA Ford, DF Paddleford, MJ Vitacco, *Benefit vs. Cost Evaluation Methodology for Fire Protection Upgrade Projects (U)*, WSRC-TR-92-141, Revision 0, May 1992.

APPENDIX 1: DATA BASE FIRE EVENTS SINCE 1/1/1975

Facility	Area	Date	Description of event
105	P	9/18/86	A FIRE OCCURRED IN 105-P, +15 LUNCHROOM, WHEN JUICE FROM MEAT FELL ON A BURNER AND IGNITED. THE FIRE WAS EXTINGUISHED WITH BAKING SODA. NO DAMAGE.
105	P	6/13/86	A FIRE WAS DISCOVERED IN THE TRASH CONTAINER IN BUILDING 105-P, 0 LEVEL LADIES CHANGE ROOM. THE FIRE WAS CAUSED BY DISCHARGED SMOKING MATERIAL AND WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE.
105	L	10/2/84	A FIRE OCCURRED IN BUILDING 105-L ROD EQUIPMENT ROOM. THE FIRE WAS CAUSED WHEN A TRANSFORMER OVERHEATED AND IGNITED. THE FIRE WAS EXTINGUISHED BY A HALON EXTINGUISHER. DAMAGE WAS \$100.
105	K	11/23/83	A FIRE OCCURRED ON A FORKLIFT IN BUILDING 105-K WHEN THE CONTACTS BECAME OVERHEATED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE, AND THE FORKLIFT SUSTAINED ONLY MINOR DAMAGE TO THE WIRING.
105	P	2/23/83	A FIRE OCCURRED IN 903-A FAN IN BUILDING 105-P. THE MOTOR OVERHEATED AND FLAMED UP. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE TO FAN IS UNKNOWN AT THIS TIME.
105	K	8/6/77	FIRE OCCURRED IN A BRAKE COIL OF A CRANE IN THE PURIFICATION AREA OF 105-K. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. BELIEVED THAT FIRE STARTED FROM AN ELECTRICAL SHORT IN THE COIL. DAMAGE WAS LIMITED TO THE COIL.
105	C	9/6/75	FIRE OCCURRED IN THE FAN ROOM AT THE +48 FT. LEVEL. EXTINGUISHED BY THE AREA BRIGADE AND FIRE DIVISION PERSONNEL.
105	K	02/20/90	A PORTABLE KEROSENE HEATER CAUGHT FIRE IN 105-K STACK AREA. THE CAUSE OF THE FIRE IS UNDER INVESTIGATION. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
105	P	08/15/90	A FIRE OCCURRED IN BUILDING 105-P TRANSFORMER ROOM #3 LIGHTING PANEL 33-M. THE FIRE WAS CAUSED WHEN A FUSE BLEW IN THE LIGHTING PANEL. THE FIRE WAS EXTINGUISHED WHEN THE POWER WAS CUT OFF.
105	K	03/15/91	A FIRE OCCURRED IN THE DISASSEMBLY TRANSFER AREA. THE FIRE WAS CAUSED BY AN ELECTRICAL SHORT ON THE CRANE HAUNCH WHICH BURNED AN ELECTRICAL CABLE IN TWO. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE. NO INJURIES.
105	P	04/17/91	A FIRE OCCURRED IN A PORTABLE KANNE MOTOR IN THE DISASSEMBLY AREA. THE FIRE WAS STARTED WHEN MOTOR OVERHEATED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO INJURIES. DAMAGE: \$200.00.

APPENDIX 1: DATA BASE FIRE EVENTS SINCE 1/1/1975

Facility	Area	Date	Description of event
105	K	06/16/91	A fire occurred in a cigarette butt can outside 105-K near the purification area. The fire was caused by discarded smoking material. The fire was extinguished by an employee. No injuries. No damage.
105	K	01/20/92	A fire burned grease on bearing housings of 910-A and 910-B fans in the fan room. The fire was caused when grease overheated. The fire was extinguished by employees. There were no injuries. Cost of damage was \$2,000.00.
105	K	01/21/92	A fire burned hydraulic hose on a drilling truck at 105-K guardhouse. the fire was caused when hose contacted the truck's exhaust. the fire was extinguished by the Fire Department. there were no injuries. Damage was \$40.00.
105	K	12/09/92	A small transformer for a door indicator shafted out causing smoke and flames. The fire was extinguished by de-energizing the transformer. Estimated cost is unknown. There were no injuries.
105	K	01/22/93	A fire occurred in the distillation area when a portable heater blower malfunctioned causing the heater to overheat and burn on the inside of the unit. The fire was extinguished with the use of a 10-lb ABC portable fire extinguisher. There were no injuries. The estimated damage was \$400.00.
105	K	05/21/93	An electrical malfunction occurred in the UPS electrical panel, in the +15 REMAC Room, during a power changeover. The fire was extinguished when an employee de-energized the equipment. There were no injuries. No damage estimate was reported.
105	K	10/05/93	On 0-Level an extension cord used for overhead lights malfunctioned causing the cord to burn. The fire was extinguished when an employee unplugged the cord. Estimated cost for cord replacement was \$10.00. there were no injuries.
105	C	11/15/93	Behind Disassembly, the heat tracer to the off-loading line shorted out destroying the heat tracer. The fire was extinguished when the power was disconnected. Estimated damages were \$85.00. There were no injuries.
105	R	03/23/95	At the construction hut behind 105-R, workers using an oxy-acetylene cutting torch for dismantling basin material equipment, accidentally ignited scrap gasket material when sparks from the torch fell into the scrap pile. Construction workers extinguished the fire using an ABC extinguisher.
105	K	01/15/93	A kerosene heater burned in the Distillation Area when an excessive amount of fuel buildup in the unit ignited causing a fireball. The fire was extinguished using one (1) ten-pound and one (1) fire-pound ABC fire extinguishers. There were no injuries. No damage estimate was reported.
105	P	07/31/93	In Building 105-P disassembly, a large floor fan sustained damages when the power cord shorted out. The power cord was worn and brittle on each end. There were no injuries. Damages were estimated at \$15.00.

APPENDIX 1: DATA BASE FIRE EVENTS SINCE 1/1/1975

Facility	Area	Date	Description of event
108	K	7/13/87	A FIRE OCCURRED IN 108-1K WHEN THE FEED FOR THE #1 COMPRESSOR SHORTED AND IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE UNKNOWN AT THIS TIME.
108	P	5/9/87	A FIRE OCCURRED IN BUILDING 108-1P. A WIRE SHORTED AND IGNITED IN AN AC GENERATOR. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE UNKNOWN AT THIS TIME.
108	K	10/5/84	A FIRE OCCURRED IN BUILDING 108-1K. A CONTROL TRANSFORMER OVERHEATED AND IGNITED, BURNING WIRING AND THE TRANSFORMER. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE WAS ONLY TO THE CONTROL TRANSFORMER AND WIRING.
108	K	07/09/90	A FIRE OCCURRED IN BUILDING 108-1K CONTROL ROOM. THE FIRE WAS CAUSED BY AN ELECTRICAL SHORT IN A CONTROL SWITCH. THE FIRE WAS EXTINGUISHED WHEN SWITCH WAS DE-ENERGIZED.
108	L	10/10/90	A FIRE OCCURRED IN A TRASH CAN ON THE ROOF OF 108-1L. CAUSE OF THE FIRE WAS A DISCARDED CIGARETTE BUTT. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
108	L	11/27/90	A FIRE OCCURRED IN BUILDING 108-1L COMPRESSOR NO. 1 STARTER CABINET. THE FIRE WAS CAUSED BY A SHORT CREATED WHEN THE STARTER CIRCUIT DID NOT DE-ENERGIZE WHEN COMPRESSOR STARTED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
108	P	3/18/82	A FIRE BURNED THE INSULATION ON A NEW ELECTRIC AIR DRYER HEATER IN 108-2P. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE WAS LIMITED TO THE INSULATION. NO DAMAGE ESTIMATE IS AVAILABLE AT THIS TIME.
108	K	2/22/79	A SMALL FIRE OCCURRED IN THE BUILDING 108-2K EMERGENCY DIESEL ROOM. AN ELECTRIC MOTOR FOR #3 AIR COMPRESSOR SHORTED OUT WHEN ENERGIZED CAUSING THE INSULATION TO BURN. THE FIRE WAS EXTINGUISHED BY THE POWER OPERATOR USING A CO2 EXTINGUISHER.
108	L	11/28/84	A FIRE OCCURRED IN BUILDING 108-4L. A TRANSFORMER OVERHEATED AND IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE UNKNOWN AT THIS TIME.
221	F	7/13/88	A FIRE OCCURRED IN BUILDING 221-F A-LINE. THE FIRE CHARRED SCAFFOLD BOARDS. THE BOARDS WERE AGAINST A DENITRATOR. FLUE HEAT FROM THE FLUE CAUSED THE BOARDS TO CHAR. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.

APPENDIX 1: DATA BASE FIRE EVENTS SINCE 1/1/1975

Facility	Area	Date	Description of event
221	F	6/28/88	A FIRE OCCURRED IN BUILDING 221-F, A.D. VACUUM ROOM. THE FIRE WAS CAUSED WHICH HOT SLAG FROM A CONSTRUCTION WELDING OPERATOR IGNITED COMBUSTIBLES IN A HUT. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
221	F	6/2/88	A FIRE OCCURRED AT THE EMERGENCY GENERATOR ROOF SOUTH END OF 221-F. THE FIRE WAS CAUSED WHEN A PIECE OF HEMP ROPE LEFT BY CONSTRUCTION BY GENERATOR STACK HEATED FROM THE STACK AND IGNITED. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION.
221	F	4/16/88	A FIRE OCCURRED IN THE WARM SHOP 221-F. WELDING CABLES WERE DISCOVERED SMOLDERING. THE FIRE WAS CAUSED BY THE BREAKDOWN OF INSULATION. CABLE OVERHEATED AND IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
221	F	2/12/88	A FIRE OCCURRED AT BUILDING 221-F 4TH LEVEL ROOF. THE FIRE WAS CAUSED WHEN ALUMINUM WELDING LEADS OVERHEATED AFTER BEING LEFT ON. THE FIRE SELF-EXTINGUISHED WHEN POWER WAS TURNED OFF. DAMAGE WAS ESTIMATED AT \$150.
221	F	1/27/88	A FIRE OCCURRED ON BUILDING 221-F ROOF EAST SIDE NSR SUPPLY AIR DUCT ZONE 4. THE FIRE WAS CAUSED BY LEAD OVERHEATING (ALUMINUM WIRE) AND IGNITING. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE UNKNOWN.
221	F	9/1/87	A FIRE BURNED TWO HOLES IN A PLASTIC HUT IN 221-F. THE FIRE WAS CAUSED BY GRINDING SPARKS FROM 410N FALLING THROUGH HOLES IN FLOOR ANOTHER ROOM. THE FIRE WAS EXTINGUISHED BY A CONSTRUCTION EMPLOYEE. NO DAMAGE.
221	F	9/3/87	A FIRE BURNED A PLASTIC HARDHAT IN BUILDING 221-F, SECOND LEVEL, SECTION 8. THE FIRE WAS CAUSED BY SPARKS FROM A CONSTRUCTION PIPE WELDING OPERATION. THE FIRE WAS EXTINGUISHED BY A CONSTRUCTION EMPLOYEE. NO DAMAGE.
221	F	7/24/87	A FIRE OCCURRED IN 221-F FIRST LEVEL COMPRESSOR ROOM SOUTH END. BELTS ON COMPRESSOR OVERHEATED AND IGNITED. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION. DAMAGE UNKNOWN AT THIS TIME.
221	F	7/31/87	A FIRE OCCURRED IN 221-F, B-LINE, 5TH LEVEL MECHANICAL LINE MAINTENANCE ROOM 1. THE FIRE WAS CAUSED BY A LOSS OF COOLING WATER (LEAK). WATER CAUSED A SHORT IN A BUS BAR. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE UNKNOWN AT THIS TIME.

APPENDIX 1: DATA BASE FIRE EVENTS SINCE 1/1/1975

Facility	Area	Date	Description of event
221	F	5/8/87	A FIRE OCCURRED IN BUILDING 221-F B LINE COLUMN FEED HEAD TANK ROOM. THE FIRE OCCURRED WHEN A CONSTRUCTION EMPLOYEE WAS CHANGING LIGHT BULBS AND THE LIGHTING ELEMENT IN A BROKEN BULB ARCHED AGAINST SOME TAPE AND IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE WITH NO DAMAGE.
221	H	6/16/86	A FIRE OCCURRED IN BUILDING 221-H, 6TH LEVEL COLD FEED PREP, WHEN PRECIPITATOR NO.2 OVERHEATED AND INSULATION BEGAN TO BURN. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
221	F	5/8/86	A FIRE OCCURRED IN A B-25 WASTE BOX AT 221-F. THE FIRE WAS CAUSED BY A CHEMICAL REACTION AND WAS EXTINGUISHED BY THE FIRE DIVISION. NO DAMAGE.
221	F	4/1/86	A FIRE OCCURRED IN BUILDING 221-F B-LINE, FIFTH LEVEL. THE FIRE WAS CAUSED BY A SHORT IN WELDING CABLES. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE WAS TO THE WELDING CABLE ONLY.
221	F	12/14/85	A FIRE OCCURRED IN BUILDING 221-F. A PAIR OF COVERALLS WAS DISCOVERED SMOLDERING IN A WASTE BOX. THE FIRE WAS CAUSED BY DISCARDED EPOXY ADHESIVE USED BY CONSTRUCTION. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE.
221	F	7/28/85	A FIRE OCCURRED IN 221-F A-LINE. OIL IN THE DENITRATOR OVERHEATED AND IGNITED. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION. NO DAMAGE.
221	F	1/27/85	A FIRE OCCURRED IN B-LINE, 221-F WHEN A HYPOLON GLOVE WAS IGNITED BY A LIGHT BULB. THE GLOVE WAS TOO CLOSE TO THE BULB. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE.
221	F	11/3/84	A FIRE OCCURRED IN 221-F JB LINE. PAINT ON THE TOP OF A CABINET IGNITED AND BURNED. THE FIRE WAS CAUSED BY SPARKS FROM A CONSTRUCTION WELDING OPERATION. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO MONETARY DAMAGE WAS SUSTAINED.
221	F	11/11/83	A FIRE OCCURRED IN BUILDING 221-F AIR COMPRESSOR ROOM WHEN A BEARING OVERHEATED CAUSING A MOTOR TO BURN. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE AND DAMAGE WAS CONFINED TO THE MOTOR. LOSS IS LIMITED TO REPLACEMENT OF THE MOTOR.
221	H	2/3/83	A LIGHT BALLAST SHORTED AND FLAMED UP IN BUILDING 221-H, 4TH LEVEL. THE FIRE WAS CAUSED BY AN ELECTRICAL SHORT AND WAS EXTINGUISHED BY CUTTING THE POWER. DAMAGE WAS LIMITED TO THE LIGHT FIXTURE AND ESTIMATED AT APPROXIMATELY \$100.

APPENDIX 1: DATA BASE FIRE EVENTS SINCE 1/1/1975

Facility	Area	Date	Description of event
221	H	6/24/82	A FIRE OCCURRED IN THE WARM SAMPLE AISLE OF 221-H. THE FIRE BURNED A WASTE BOX AND A TIRE ON AN OXY-ACETYLENE CART. THE FIRE APPARENTLY STARTED FROM A PIPE BURNING OPERATION ON THE DAY SHIFT AND WAS NOT DISCOVERED UNTIL 5:00 PM ON THE NEXT SHIFT. THERE WAS NO CONTAMINATION RELEASE. DAMAGE IS ESTIMATED AT LESS THAN \$200.00.
221	H	3/2/82	A FIRE OCCURRED IN THE 221-H HOT SAMPLE AISLE WHEN A PLASTIC WRAPPED WASTE BOX IGNITED. THE FIRE WAS EXTINGUISHED BY EMPLOYEES AND DAMAGE WAS LIMITED TO THE PLASTIC. IT IS BELIEVED THE FIRE WAS STARTED WHEN ACID-SOAKED WASTE SELF-IGNITED. NO DAMAGE WAS SUSTAINED.
221	H	1/30/80	A NEW PLASTIC BAGGED HEPA FILTER WAS PLACED IN 221-H LINE RECOVERY CABINET. INADVERTENTLY, THE FILTER WAS PLACED ON A HOT DISSOLVER, WHICH IS BELIEVED TO HAVE IGNITED THE PLASTIC BAG. AN AUTOMATIC HALON SYSTEM EVENTUALLY EXTINGUISHED THE FIRE. TWO CABINET WINDOWS WERE CRACKED. NO CONTAMINATION RELEASE TO ATMOSPHERE, VERY LITTLE IN ROOM.
221	H	8/14/79	A FIRE BURNED A SOLENOID ON A FLOW CONTROL VALVE IN SECTION 15, 221-H SECOND LEVEL. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. CAUSE IS UNKNOWN.
221	F	10/9/78	A FIRE OCCURRED IN BUILDING 221-F A-LINE WHEN THE SHAFT SEAL ON THE PLOW BLADE OF DENITRATOR C-3-1 FAILED, DROPPING OIL INTO THE HOT POT. THE RESULTING FLASH FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
221	F	10/16/78	A FIRE OCCURRED IN 221-F A-LINE WHEN ATOMIC WIPES BEING USED TO CLEAN UP A LIQUID SPILL ON TOP OF DENITRATOR C-3-2 IGNITED AFTER THEY WERE THROWN INTO A WASTE RECEPTACLE. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
221	F	8/31/78	AN INDUSTRIAL FIRE OCCURRED IN 221-F 6TH LEVEL. DISSOLVER OPERATING ROOM WELDING WAS BEING DONE INSIDE A PLASTIC CONTAMINATION CONTAINMENT HUT. HEAT CAUSED TAPE USED TO PREPARE HUT TO IGNITE.
221	F	4/22/75	B-LINE, 221-F. WELDING SPARKS DROPPED ON A FOLDED WASTE BOX. FIRE WAS EXTINGUISHED WITH A CO2 FIRE EXTINGUISHER.
221	S	09/14/90	A FIRE WAS DISCOVERED IN A BUTT CAN IN BUILDING 221-S, STAIRWELL 6, LEVEL 1. THE FIRE WAS SUSPECTED TO BE CAUSED BY DISCARDED SMOKING MATERIAL. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
221	H	11/29/90	A FIRE OCCURRED IN A COPIER IN BUILDING 221-H. THE FIRE WAS CAUSED BY A JAM IN THE MACHINE. THE FIRE BURNED OUT.

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Facility	Area	Date	Description of event
221	F	11/17/91	A fire occurred in FB-Line 5th level mechanical line control room. The fire was caused by possible overheating in the compressor compartment of the #2 A/C unit. The fire was extinguished by an employee. No injuries. Damage; \$912.00.
221	F	08/19/91	A scaffolding was located above the 221-F emergency diesel generator exhaust system. The diesel was in operation, which caused the scaffolding to heat up and smolder. The heat caused scorching and blackening to the scaffolding boards. No injuries and no damage.
221	H	06/10/92	In the Hot Crane Cab, a 13-pound Halon 1211 extinguisher was discharged to extinguish a short in the electrical wiring. Damage was minimal. There were no injuries.
221	FB	08/05/92	42 pounds of Halon was discharged manually when sparks from a maintenance mechanic welding torch ignited Class A materials below the scaffolding on which the work was being performed. There were no injuries. Damage was estimated to be \$123.90.
221	F	03/02/93	A fire occurred on the 3rd level, Section 8, when sparks of hot metal particles falling through a ventilation duct opening from the 4th level during grinding activities caused dust on the top of a ceiling duct to smoke and smolder. Operations personnel located and removed the hot particles and placed them into a bucket of water to be extinguished. There were no injuries. No damage estimate was reported.
221	H	04/12/93	On the 2nd level, Section 10, a fire occurred when an electrical short in the wiring supplying the 10.3C Melotron pressure switch malfunctioned, causing the Melotron switch to burn. There were no injuries. Estimated damage was \$584.00.
221	S	10/11/93	While workers were welding on the roof of 221-S, the fire retardant cloth cover slipped and exposed a cloth cover to welding slag, which started to smolder. The fire was extinguished using a 10 lb. ABC extinguisher. There was no damage and no injuries.
221	H	02/15/94	In MCC #4, 1st level, construction was welding a support for new conduit in the ceiling when a spark fell on a mop head causing the mop head to ignite. Construction worker extinguished the fire using an ABC fire extinguisher. Estimated damage was \$10.00. There were no injuries.
221	S	04/05/94	On the 3rd level east, fire protection welders were welding pipe brackets to the ceiling when sparks from the welding dropped into debris on top of the air duct, causing it to ignite. The fire was extinguished by a fire watch using an ABC extinguisher. Estimated damage was \$15.00. There were no injuries.
221	H B	04/15/94	In glove box #9, a lab technician discovered flames and smoke coming from a cleaning cloth that was lying on top of a multiple-outlet receptacle strip in the glove box. Estimated damages were \$25.00. There were no injuries.

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Facility	Area	Date	Description of event
221	F	5/12/94	A small deep seated fire involving Class A materials (rags, wooden spool, and a nylon rope) occurred in the Warm Canyon shop. The fire was from an unknown origin but was believed to have started from a welding job that was performed earlier that day. Three 10-pound ABC fire extinguishers were used during the extinguishment. Estimated damages were \$40.00. There were no injuries.
221	F	05/03/95	In the 1st level, section 5, during a transformer replacement, a transformer shorted out and began to smoke. The power was de-energized and the fire was extinguished. Estimated damage received was \$600.00. There were no injuries.
221	F	7/21/80	A FIRE OCCURRED IN THE JB-LINE, MECHANICAL LINE PRESSURE CHAMBER MAKE UP STATION GLOVE BOX. THE FIRE STARTED WHEN A VACUUM CLEANER SHORTED. IT WAS EXTINGUISHED BY AN EMPLOYEE PUNCTURING A GLOVE AND USING AN EXTINGUISHER. DAMAGES WERE CONFINED TO THE VACUUM CLEANER.
221	F	06/16/91	A fire occurred in the A-Line at column F-8. The fire was caused when acid fumes leaking from a line ignited insulation around pipe. The fire was extinguished by an employee. No injuries. Damage; \$10,000.00.
221	H	12/15/93	A welding cable used by construction workers shorted out and melted the insulation from the connector end, causing a fire. The fire was extinguished using a fire extinguisher. Estimated damage was \$75.00. There were no injuries.
221-1	F	1/20/89	A FIRE BURNED INSULATION ON DENITRATOR FURNACE GAS PIPE. THE INSULATION OVERHEATED AND IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
221-1	F	12/03/93	In the 1st level MCC, the transformer control circuitry shorted out when the power was restored to the 221-1F Building. The fire self-extinguished when the power was de-energized to the transformer. Estimated damage was \$100.00. There were no injuries.
221	F	06/05/94	In Section 1, the electrical wiring on a disconnect switch overheated and burned, causing estimated damages of \$2,600. the fire was extinguished using a 10 lb. ABC fire extinguisher. There were no injuries.
232	H	12/10/86	A FIRE OCCURRED IN 232-H, -17 LEVEL IN THE LINE 1 PROCESS ROOM FY2 HOOD. PIPE FITTERS WERE REMOVING AN ELL FROM A REFRIGERATION LINE WHEN THE ELL BROKE AND THE COMPRESSOR OIL RELEASED IGNITED. NO DAMAGE.
232	H	11/1/83	THREE V BELTS IGNITED AND BURNED ON A PUMP IN 232-H. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE AND DAMAGE WAS LIMITED TO THREE V BELTS. MONETARY LOSS WAS \$15.

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Facility	Area	Date	Description of event
232	H	2/4/76	A FIRE OCCURRED IN 232-H BASEMENT, CLEAN MECHANICAL ROOM. MAINTENANCE WAS BURNING BOLTS OFF FLANGES OF COOLING WATER INLET LINES PREPARATORY TO REPAIR OF COILS DAMAGED DURING FREEZING WEATHER. CORK INSULATION BEGAN SMOLDERING DUE TO HEAT/AIR FLOW ACROSS INSULATION
232	H	05/04/90	A FIRE OCCURRED IN THE DIESEL GENERATOR ROOM 1 LEVEL 11, BUILDING 232-H. INSULATION PAPER ON DIESEL GENERATOR EXHAUST OVERHEATED AND FLAMED UP. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE UNKNOWN.
234	H	1/21/82	A FIRE OCCURRED IN A POWER SUPPLY TRANSFORMER IN BLDG. 234-H. THE CAUSE OF THE FIRE IS UNKNOWN. IT WAS EXTINGUISHED BY EMPLOYEES.
234	H	06/17/90	A FIRE OCCURRED IN BUILDING 234-H. THE FIRE WAS CAUSED WHEN COMPRESSOR BEARINGS FROZE UP AND BURNED DRIVE BELTS AND OIL ABSORBENT PIGS AROUND COMPRESSOR ALSO BURNED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
234	H	12/11/90	A FIRE OCCURRED IN THE ENGINE COMPARTMENT OF A FORKLIFT BEING USED AT THE 234-H NORTH LOADING DOCK. THE BATTERY CABLES SHORTED OUT, CAUSING THE FIRE. THE FIRE WAS EXTINGUISHED BY THE OPERATOR. NO INJURIES.
234	H	09/05/91	At Intermediate Tritium a small gasoline engine ignited and burned. The cause was a leaking carburetor. The fire was extinguished by construction personnel using two (2) ten-pound ABC extinguishers. There were no injuries. The motor was replaced with no loss in production. The total fire damage was \$50.00.
234	H	06/04/93	At a construction shed next to 234-H, where a welder was cutting metal, sparks ignited dry grass in the area. The fire was extinguished using a 10-pound ABC extinguisher and water from a fire apparatus. There were no injuries. No damage estimate was reported.
235	F	12/17/80	A FIRE BURNED A LIGHT BALLAST IN BLDG. 235-F. IT WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGES WERE APPROXIMATELY \$25.00.
235	F	10/5/89	A FIRE OCCURRED IN BUILDING 235-F PLUTONIUM EXPERIMENTAL FACILITY. THE FIRE WAS CAUSED WHEN A VACUUM PUMP MOTOR BURNED OUT. THE FIRE WAS EXTINGUISHED WHEN THE HALON SYSTEM WAS ACTIVATED.
235	F	01/23/90	A FIRE OCCURRED IN A PROPANE TORCH. THE FIRE WAS CAUSED WHEN A LEAK IN THE BOTTLE IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
247	F	1/25/88	A FIRE OCCURRED IN BUILDING 247-F AT WASTE WATER HOLDING TANK # 2, PH SAMPLING STATION. THE FIRE WAS CAUSED BY AN ELECTRICAL SHORT IN A HEAT TRACING WHICH IGNITED INSULATION AND BURNED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE ESTIMATED AT LESS THAN \$100.

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Facility	Area	Date	Description of event
247	F	5/24/87	A FIRE OCCURRED IN BUILDING 247-F SEMI-FINISHING FURNACE ROOM. THE FIRE WAS CAUSED BY RODS THAT OVERHEATED, IGNITING TWO BEARING BLOCKS WHICH IGNITED THE PLEXIGLASS SHIELD. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE \$50.
247	F	1/25/89	A FIRE OCCURRED IN BUILDING 247-F. SOUTH FINISHING ROOM. THE FIRE WAS CAUSED BY SOLUTION THAT WAS BEING CLEANED FROM EQUIPMENT. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
247	F	08/11/90	A FIRE OCCURRED IN BUILDING 247-F WASTE WATER TREATMENT FACILITY. THE FIRE WAS CAUSED WHEN A SLICE CONNECTOR ON A HEAT TRACE WIRE BROKE AND IGNITED INSULATOR. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
247	F	09/26/94	Subcontractors on top of the building, used gasoline to exterminate a bed of fire ants while replacing the roof. When grinding operations began later that day the gasoline ignited but caused no damages. the fire was extinguished using an ABC portable fire extinguisher. There were no injuries.
313	M	6/9/88	A FIRE OCCURRED ON THE ROOF OF BUILDING 313-M. THE FIRE OCCURRED WHEN A SUBCONTRACT EMPLOYEE WAS USING A HEAT GUN TO DRY WOOD. A PIECE OF 2X4 IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
313	M	2/4/88	A FIRE OCCURRED IN BUILDING 313-M HDSB PIT. THE FIRE WAS CAUSED WHEN AN ELECTRICAL CABLE ARCED AND BEGUN TO MELT. MOLTEN COPPER FELL ON CARDBOARD AND IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE UNKNOWN.
313	M	5/7/87	A FIRE OCCURRED IN BUILDING 313-M CAP CAN ROOM. GREASE WAS IGNITED IN A DEGREASER TANK FROM A WELDING OPERATION. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE.
313	M	1/21/87	A FIRE OCCURRED IN THE HDS PRESS EXHAUST HOOD IN 313-M AS THE RESULT OF A CONSTRUCTION WELDING OPERATION. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE.
313	M	11/3/86	A FIRE OCCURRED IN 313-M AUTOCLAVE PIT. FIVE GALLONS OF PAINT BURNED WHEN CONSTRUCTION WELDING SET OFF FUMES IN A PAINT CAN. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE, AND NO DAMAGE WAS SUSTAINED.
313	M	11/8/86	A FIRE OCCURRED IN BUILDING 313-M BASEMENT. THE FIRE WAS CAUSED BY A CONSTRUCTION WELDING OPERATION. OIL AND GREASE ON A CONDENSATE TANK IGNITED AND BURNED. THE FIRE WAS EXTINGUISHED BY CONSTRUCTION. NO DAMAGE.

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Facility	Area	Date	Description of event
313	M	9/17/85	A FIRE OCCURRED IN BUILDING 313-M AT THE HOT DIE SIZE PRESS. A HOT SLUG FELL FROM THE MACHINE THROUGH GRATING AND IGNITED OILY RESIDUE. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE OR LOSS TO PRODUCTION.
313	M	9/25/85	A FIRE OCCURRED IN 313-M WHEN THE TURRET ARM AT THE PRESS DROPPED A SLUG IN THE PIT UNDER THE TURRET. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE.
313	M	1/31/85	A FIRE OCCURRED IN 313-M. THE FIRE WAS CAUSED BY AN ELECTRICAL SHORT ON A SOLENOID VALVE. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE.
313	M	1/31/85	A FIRE OCCURRED IN 313-M PRESS AREA. THE FIRE WAS CAUSED BY HOT METAL FALLING ON CARDBOARD WHICH IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE WAS INCURRED.
313	M	10/16/84	AN ELECTRICAL FIRE OCCURRED IN BUILDING 313-M. AN ARCO WELDER/TRIMMER CAUGHT FIRE WHEN A ROLLER BOUND UP ON HOUSING. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGES HAVE NOT BEEN DETERMINED.
313	M	1/4/84	A FIRE OCCURRED IN 313-M. THE ENDBONDER MOTOR OVERHEATED AND IGNITED WIRING OF MOTOR AND GREASE. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE WAS TO THE MOTOR AND WIRING. LOSS UNKNOWN AT THIS TIME.
313	M	12/12/83	A FIRE OCCURRED IN 313-M DISTILL DEGREASER TANK WHEN LIQUID VAPOR FROM TRICHLOROETHANE IGNITED. CAUSE OF FIRE IS UNKNOWN. FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO MONETARY LOSS SUSTAINED.
313	M	11/12/83	A FIRE OCCURRED IN BUILDING 313-M AT THE END BONDER WHEN A HYDRAULIC HOSE BURNT AND SPRAYED OIL ON A HEATING COIL. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE AND DAMAGE WAS LIMITED TO THE HYDRAULIC HOSE.
313	M	10/22/82	A CUT-OFF SAW CUT INTO A SLUG CAUSING SPARKS WHICH IGNITED OIL RESIDUE ON THE SAW BLADE IN 313-M. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO CONTAMINATION OR PROPERTY LOSS RESULTED.
313	M	8/31/82	THE REMAINS OF A URANIUM SLUG BURNED IN 313-M AFTER BEING DISCHARGED FROM AN AUTOCLAVE. THE SLUG WAS COVERED WITH G-1 POWDER TO STOP THE OXIDATION PROCESS. NO CONTAMINATION OR PROPERTY LOSS RESULTED FROM THE INCIDENT.
313	M	7/29/82	A FIRE OCCURRED IN THE 313-M HOT DIE SIZE PIT WHEN A SLUG DROPPED IN THE PIT IGNITING OIL ON THE FLOOR. IT WAS EXTINGUISHED BY AN EMPLOYEE. THERE WERE NO DAMAGES.

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Facility	Area	Date	Description of event
313	M	1/21/82	A FIRE OCCURRED IN 313-M WHEN A CUT-OFF SAW HIT A URANIUM CORE. THE SPARKS FROM THIS ACTION IGNITED THE OILY FILM ON THE SAW GUARD. A MALFUNCTION OF THE CORE POSITIONER PROBE PLACED THE CORE IN THE PATH OF THE SAW BLADE. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGES WERE INCURRED.
313	M	4/3/81	A FIRE OCCURRED IN THE HOT DIE SIZE PIT IN 313-M. THE FIRE STARTED WHEN HOT METAL DROPPED ON LUBRICATING OIL IN THE PIT. IT WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE WAS SUSTAINED.
320	M	11/18/87	A FIRE OCCURRED IN A ROOFING TAR PIT AT 320-M. THE FIRE OCCURRED WHEN THE TAR KETTLE OVERHEATED AND IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. NO DAMAGE.
320	M	7/9/86	A FIRE OCCURRED IN BUILDING 320-M. THE FIRE WAS CAUSED BY A LITHIUM POT EXPLOSION. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION. DAMAGE UNKNOWN AT THIS TIME.
320	M	6/20/80	A FIRE IN 320-M INVOLVED LITHIUM WASTE BENEATH A SAW. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. THE EXACT CAUSE OF THE FIRE IS UNKNOWN. NO DAMAGE WAS SUSTAINED.
320	M	6/3/76	A PIECE OF SCRAP MAGNESIUM IGNITED WHEN IT WAS ADDED TO MOLTEN METAL IN AN AIR MELT FURNACE IN BUILDING 320-M. EXTINGUISHED BY AN EMPLOYEE.
320	M	7/1/75	ALCOHOL, BEING USED AS A COOLANT IN AN ALUMINUM MACHINING OPERATION IGNITED. EXTINGUISHED BY AN EMPLOYEE USING A FIRE EXTINGUISHER.
320	M	3/18/75	ALCOHOL, USED AS A COOLANT IN MACHINING PARTS ON A LATHE, IGNITED IN BUILDING 320-M. FIRE WAS EXTINGUISHED BY AN EMPLOYEE USING AN EXTINGUISHER.
320	M	12/19/90	A FIRE OCCURRED IN A DISTILLATION RANGE APPARATUS IN BUILDING 320-M. THE FIRE WAS CAUSED WHEN A FLASK CONTAINING DIESEL FUEL RUPTURED AND THE DIESEL FUEL IGNITED. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE.
320	M	07/23/92	The electrical coil wiring on a welding machine on the west side of the building shorted out and began arcing, igniting oil on the breather of the welding machine. There were no injuries. Estimated damage was \$50.00.
320	M	01/13/94	In lab room 134, the flash point tester malfunctioned during testing, causing the paint that was used in the testing to ignite and burn. The fire was extinguished by an employee using a 10 pound ABC extinguisher at a cost of \$80.00. There were no injuries.

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Facility	Area	Date	Description of event
320	M	12/19/90	A FIRE OCCURRED IN A DISTILLATION RANGE APPARATUS IN 320-M. THE FIRE WAS CAUSED WHEN A FLASK CONTAINING DIESEL FUEL RUPTURED AND THE DIESEL FUEL IGNITED AFTER COMING IN CONTACT WITH A HEATER COIL. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE \$1,450.00. NO INJURIES.
321	M	11/13/85	A FIRE OCCURRED INSIDE A BOX TRANSFORMER AT 321-M. THE FIRE WAS CAUSED BY AN ELECTRICAL SHORT. THE FIRE WAS EXTINGUISHED BY AN EMPLOYEE. DAMAGE UNKNOWN AT THIS TIME.
321	M	6/26/80	A fire burned insulation and a timer on a welder in 321-M. The fire was caused by a short in the timer. It was extinguished by an employee. Damages are estimated at \$60.00.
321	M	3/13/79	A fire occurred in building 321-M when sparks from an overhead welding operation ignited oil in a lathe pan. The fire was extinguished by an employee using a fire extinguisher. This was a construction fire.
321	M	2/9/79	A fire occurred in 321-M machining room when alcohol, being used as a coolant, ignited during a core sawing operation. The fire was extinguished by an employee using a fire extinguisher. There was no damage.
321	M	1/31/79	A fire occurred in 321-M when alcohol, being used as a coolant, ignited during a core sawing operation. The fire was extinguished by an employee using a fire extinguisher.
321	M	8/4/75	Fire occurred in the electrical insulation on wiring to one of the casting furnaces. Extinguished with a fire extinguisher.
321	M	10/9/89	A fire occurred in oven area in building 321-M. The fire was caused by an electrical short in the transformer. The fire was extinguished by the fire department. Damage unknown.
321	M	02/20/92	An electrical fire occurred when construction electricians energized a .5 KVA transformer during a facility equipment turnover inspection. The fire was extinguished by the electricians. No injuries. Damage estimated at \$724.50.
773	A	5/24/88	A fire occurred in a furnace in building 773-A fab-lab. Lubricant was being heated to 2000 C, when the lubricant reached its flash point, it ignited. The fire was allowed to self extinguish.
773	A	3/28/88	A fire occurred in building 773-A B-070. The fire was started by sparks from a construction cutting operation which fell into a pit and ignited plastic and plexiglass in the pit. The fire was extinguished by a construction employee. No damage.
773	A	5/20/85	A fire occurred outside the fab lab at 773-A. The fire occurred when trash and rags on an energized heat strip ignited. The fire was extinguished by an employee. No damage.
773	A	2/24/84	A microwave oven caught fire in building 773-A. The inside top of the oven fell and ignited. The fire was extinguished by an employee.

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Facility	Area	Date	Description of event
773	A	11/17/83	A fire occurred in the decon and disassembly facility in F-wing 773-A. The fire was caused by a welder burning operation. A metal box was being cut up for disposal when a rubber glove ignited. The fire was extinguished by the halon system.
773	A	9/7/83	A fire occurred in a computer cabinet in building 773-A when a routine load test was being made and some insulation burned. The cause has not been determined. The fire was extinguished with a CO2 extinguisher. Damage has been estimated at between \$500 and \$1000
773	A	3/28/83	A fire occurred in 773-A. A welder was cutting floor grating when the slag ignited brimstone floor sealant used for sealing floor tiles. The fire was extinguished by the employee. No damage was sustained
773	A	12/10/81	A fire occurred inside a fluorine cylinder containment cabinet located in 773-A. The exact cause of the fire has not been determined but the fire is known to have started in a flow limiting valve and eventually caused the cylinder to rupture. The fire self-extinguished.
773	A	10/17/80	A fire burned an electric motor on a photo enlarger in the 773-A print shop. The fire apparently started as a result of a short in the motor. It was extinguished by an employee.
773	A	6/26/79	Fire occurred in a glove box in 773-A. Cause of fire is unknown. Was extinguished by an employee.
773	A	11/15/77	Fire occurred in a trash can. Cause unknown.
773	A	8/16/77	Building 773-A, laboratory C-111. A sample was being prepared for etching. A spark was created from use of methyl alcohol.
773	A	2/10/76	Feed preparation box of the sed-i facility in 773-A. A metal can containing a defective rubber glove was inadvertently placed on the electrical coil to an induction furnace. A small hole was burned in the can and ignited the glove.
773	A	3/31/75	Welding sparks ignited insulation in the fan room of the high level cave area of 773-A. The fire was extinguished with a fire extinguisher and water from the fire department pumper.
773	A	10/7/88	A fire occurred in building 773-A. The fire burned paper and plastic. The fire was caused by hot slag from a cutting operation. The fire was extinguished by an employee.
773	A	08/08/90	A fire occurred in a glove box in building 773-A. The fire was caused when a polyurethane bottle came in contact with a hot plate. The fire was extinguished by the fire department.

APPENDIX 2: DATA BASE FIRE EVENTS SINCE 1/1/1975

Facility	Area	Date	Description of event
221	F	6/2/88	A FIRE OCCURRED AT THE EMERGENCY GENERATOR ROOF SOUTH END OF 221-F. THE FIRE WAS CAUSED WHEN A PIECE OF HEMP ROPE LEFT BY CONSTRUCTION BY GENERATOR STACK HEATED FROM THE STACK AND IGNITED. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION.
221	F	7/24/87	A FIRE OCCURRED IN 221-F FIRST LEVEL COMPRESSOR ROOM SOUTH END. BELTS ON COMPRESSOR OVERHEATED AND IGNITED. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION. DAMAGE UNKNOWN AT THIS TIME.
221	F	7/28/85	A FIRE OCCURRED IN 221-F A-LINE. OIL IN THE DENITRATOR OVERHEATED AND IGNITED. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION. NO DAMAGE.
221	H	1/30/80	A NEW PLASTIC BAGGED HEPA FILTER WAS PLACED IN 221-H LINE RECOVERY CABINET. INADVERTENTLY, THE FILTER WAS PLACED ON A HOT DISSOLVER, WHICH IS BELIEVED TO HAVE IGNITED THE PLASTIC BAG. AN AUTOMATIC HALON SYSTEM EVENTUALLY EXTINGUISHED THE FIRE. TWO CABINET WINDOWS WERE CRACKED. NO CONTAMINATION RELEASE TO ATMOSPHERE, VERY LITTLE IN ROOM.
235	F	10/5/89	A FIRE OCCURRED IN BUILDING 235-F PLUTONIUM EXPERIMENTAL FACILITY. THE FIRE WAS CAUSED WHEN A VACUUM PUMP MOTOR BURNED OUT. THE FIRE WAS EXTINGUISHED WHEN THE HALON SYSTEM WAS ACTIVATED.
320	M	7/9/86	A FIRE OCCURRED IN BUILDING 320-M. THE FIRE WAS CAUSED BY A LITHIUM POT EXPLOSION. THE FIRE WAS EXTINGUISHED BY THE FIRE DIVISION. DAMAGE UNKNOWN AT THIS TIME.
321	M	10/9/89	A FIRE OCCURRED IN OVEN AREA IN BUILDING 321-M. THE FIRE WAS CAUSED BY AN ELECTRICAL SHORT IN THE TRANSFORMER. THE FIRE WAS EXTINGUISHED BY THE FIRE DEPARTMENT. DAMAGE UNKNOWN.
773	A	11/17/83	A FIRE OCCURRED IN THE DECON AND DISASSEMBLY FACILITY IN F-WING 773-A. THE FIRE WAS CAUSED BY A WELDER BURNING OPERATION. A METAL BOX WAS BEING CUT UP FOR DISPOSAL WHEN A RUBBER GLOVE IGNITED. THE FIRE WAS EXTINGUISHED BY THE HALON SYSTEM.
773	A	3/31/75	WELDING SPARKS IGNITED INSULATION IN THE FAN ROOM OF THE HIGH LEVEL CAVE AREA OF 773-A. THE FIRE WAS EXTINGUISHED WITH A FIRE EXTINGUISHER AND WATER FROM THE FIRE DEPARTMENT PUMPER.
773	A	08/08/90	A fire occurred in a glove box in building 773-A. The fire was caused when a polyurethane bottle came in contact with a hot plate. The fire was extinguished by the fire department.