June 1996

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**Idaho National
Engineering Laboratory
Radiological Control
Performance Indicator Report**

First Quarter – Calendar Year 1996

***Date Published
June 1996***

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Lockheed
Idaho Technologies Company

INEL-96/0191 (1st QTR)

**Idaho National Engineering Laboratory
Radiological Control Performance Indicator Report**

**First Quarter
Calendar Year 1996**

R. Reavis

Published June 1996

**Idaho National Engineering Laboratory
Radiological Control
Lockheed Martin Idaho Technologies Company
Idaho Falls, Idaho 83415**

**Prepared for the
U.S. Department of Energy
Assistant Secretary for Environment, Safety, and Health
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Document Title:

Idaho National Engineering Laboratory
Radiological Control Performance Indicator Report

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6-26-96

Date

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6/24/96

Date

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Lockheed Idaho Technologies Company**INTERDEPARTMENTAL COMMUNICATION**

Date: April 30, 1996**To:** G. L. Courtney MS 3406 6-4422**From:** R. Reavis MS 3406 6-3264**Subject:** INEL OCCUPATIONAL RADIATION EXPOSURE DURING CY-1992/1994
- RR-10-96

Approximately 80% of all occupational radiation exposure received by personnel at the Idaho National Engineering Laboratory (INEL) occurs at the Idaho Chemical Processing Plant (ICPP). This is due to higher radiation fields encountered during radiological work activities. During CY-1992, the work scope at the ICPP was greatly reduced due to Land Disposal Restrictions (LDR) and Resource Conservation and Recovery Act (RCRA) Compliance issues. The restrictions limited the amount of radioactive waste generated. The total occupational radiation exposure received at the ICPP during CY-1992 was 40.3 person-rem, compared with 115 person-rem received at the ICPP during CY-1991. In addition, the mission of the ICPP changed. Fuel reprocessing operations were halted and emphasis was placed on environmental restoration, decontamination and decommissioning. Due to reduced occupational exposure received by personnel at the ICPP, the overall INEL exposure was consequently lower than in previous years.

During CY-1993, the Advanced Test Reactor (ATR) was involved in a Core Internals Change-Out (CIC). The outage increased personnel exposure for Power Reactor Operations from 19 person-rem the previous year, to 32 person-rem.

Several major projects contributed to the ICPP occupational exposure. During the WL-101/102 Vault Liner Project personnel received approximately 80 person-rem. During fuel transfer preparations at CPP-603 personnel received approximately 10 person-rem. At CPP-627 personnel were involved in the RAL PEW Upgrade Project during which they received approximately 10 person-rem.

In CY-1994, ATR was involved in another CIC outage. Personnel received approximately 46 person-rem during the outage.

The ICPP was involved in several major projects in CY-1994. The Tank Farm Valve Box Upgrade Project, during which personnel received 54 person-rem was the primary contributor to the facility's overall exposure. Personnel received 22 person-rem during fuel transfer operations between CPP-603 and CPP-666. Preparations for the NWCF Project High Level Liquid Waste Evaporator installation involved decon operations, during which personnel received approximately 15 person-rem.

G. L. Courtney
April 30, 1996
RR-10-96
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Occupational radiation exposure for personnel at the INEL increased during this period due to expanded work scope, mission change and work in radiological areas that required entries into higher radiation fields.

RR

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Soil Contamination Areas Outside Fence Boundaries

	CATEGORY	AREA		SOIL CONTAMINATION AREA (SCA)
		ACRES	FT ²	
CFA				
691 Drain Field	P	5.3	230868	SCA
Drain Field	P	1.0	43560	SCA
Ditch & Pit	P	1.0	43560	SCA
TOTAL		7.3	317988	
CPP				
Outside Fence	P	19.2	836352	SCA
TOTAL		19.2	836352	
ANL WEST				
ANL West	P	.0029	130	SCA
TOTAL		0.0029	130	
EBR-1				
EBR-1 Large	P	.53	22800	SCA
EBR-1 Small	P	.006	280	SCA
EBR-1 Ditch	P	.264	11500	SCA
TOTAL		0.8	34580	

BORAX				
BORAX-1	P	.64	27878	SCA
BORAX-V	P	1.6	69696	SCA
TOTAL		2.24	97574	
ARA				
ARA I & II	P	9	392040	SCA
Access Road ARA I, II, SL-I	P	116	5052960	SCA
ARA III Pond	P	.25	10890	SCA
ARA Inside Fence	P	2.267	98755	SCA
TOTAL		127.517	5554645	
OMRE				
OMRE	P	.06	2637	
TOTAL		0.06	2637	
TRA				
Pond Waste (old)	P	1.72	75000	SCA
TRA Leach Sewage (old)	P	6.4	278784	SCA
TOTAL		8.12	353784	
GRAND TOTAL		165.2399	7197690	

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INEL Radiological Control Performance Indicator Overview

First Quarter 1996

		<u>Actual</u>	<u>Goal or Average</u>
Collective Year-to-Date Penetrating Radiation Dose		49.9 person-rem	236.4 person-rem (Goal)
Year-to-Date Average Worker Dose		0.091 rem	0.179 rem (3 Year Average)
Maximum Year-to-Date Penetrating Dose to a Worker		1.133 rem	1.500 rem (Goal)
Maximum Year-to-Date Neutron Dose to a Worker		0.032 rem	0.125 rem (3 Year Average)
Year-to-Date Skin Contaminations		5	26 (3 Year Average)

Legend

Needs Attention

OK

Good

		<u>Actual</u>	<u>Goal or Average</u>
Year-to-Date Clothing Contaminations		18	70 (3 Year Average)
Year-to-Date Airborne Radioactivity Events		0	2 (3 Year Average)
Year-to-Date Radioactive Material Intakes		10	8 (3 Year Average)
Contamination Area		196,667 ft ²	203,700 ft ² (3 Year Average)
High Contamination Area		297,663 ft ²	301,500 ft ² (3 Year Average)
Airborne Radioactivity Area		84,712 ft ²	81,633 ft ² (3 Year Average)
Year-To-Date Spills		12	150 (3 Year Average)

INEL Facility Radiological Control Performance Indicator Overview

First Quarter 1996

	CFA	ICPP	PBF	RWMC	TRA	TAN/SMC
Collective Year-to-Date Penetrating Radiation Dose (person-rem)	0.562	40.640	0.133	1.340	4.658	2.417
Year-to-Date Average Worker Dose (rem)	0.014	0.143	0.017	0.023	0.034	0.064
Maximum Year-to-Date Penetrating Dose to a Worker (rem)	0.040	1.133	0.022	0.071	0.213	0.299
Maximum Year-to-Date Neutron Dose to a Worker (rem)	0.030	0.019	0.000	0.000	0.032	0.000
Year-to-Date Skin Contaminations	0	3	0	0	0	2

Legend

Needs Attention

OK

Good

	CFA	ICPP	PBF	RWMC	TRA	TAN/SMC
Year-to-Date Clothing Contaminations	0	14	0	0	2	2
Year-to-Date Airborne Radioactivity Events	0	0	0	0	0	0
Year-to-Date Radioactive Material Intakes	1	5	0	0	0	4
Contamination Area - ft ²	17,105	65,419	7,378	0	52,516	54,249
High Contamination Area - ft ²	372	251,961	2,288	29,525	1,991	11,526
Airborne Radioactivity Area - ft ²	0	82,712	2,000	0	0	0
Year-to-Date Spills	0	12	0	0	0	0

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Executive Summary

Radiological Control Performance Indicator Report

First Quarter 1996

This report provides an analysis of the Radiological Control Program for the first quarter of Calendar Year 1996 (CY-1996), at the Idaho National Engineering Laboratory (INEL). The INEL is under the direction of Lockheed Martin Idaho Technologies Company (LMITCO). The Radiological Control Performance Indicator Report is provided in accordance with Article 133 of the INEL Radiological Control Manual (RCM).

- Total INEL penetrating radiation exposure through the end of the first quarter was 49.9 person-rem (p-rem).
- Average penetrating radiation dose to an INEL radiation worker through the end of the first quarter was 0.091 rem.
- Maximum penetrating radiation dose to an INEL worker through the end of the first quarter was 1.133 rem.
- Maximum neutron radiation dose to an INEL worker through the end of the first quarter was 0.032 rem.
- The total number of INEL skin contaminations through the end of the first quarter was five, all resulted in Occurrence Reports (ORs).
- The total number of INEL clothing contaminations through the end of the first quarter was 18 of which 10 resulted in ORs.
- Total number of airborne radioactivity events exceeding 10% Derived Air Concentrations (DAC) through the end of the first quarter was zero.
- Total number of radioactive material intakes assigned a dose of 10 mrem or more was 10. No intakes met Department of Energy reportable criteria.
- Total INEL Contamination Area was 196,667 square feet, total High Contamination Area was 297,663 square feet, and total Airborne Radioactivity Area was 84,712 square feet.
- The total number of radioactive spills or releases was 12, four of which resulted in ORs.

Radiological Control Performance Indicator Charter

The INEL Radiological Control Performance Indicator Report is provided quarterly in accordance with Article 133 of the INEL RCM. Indicators are used as a measure of performance of the Radiological Control Program and as a motivation for improvement, not as a goal in themselves. These indicators should be used by management to assist in focusing priorities and attention and adherence to As-Low-As-Reasonably-Achievable (ALARA) practices.

The ALARA Committees establish ALARA goals for the INEL based on anticipated radiological work activities with the assistance of the facility organizational managers and supervisors.

Performance goals are realistic and measurable. Stringent goals are set at least annually to reflect expected workloads and improvement of radiological performance. Goals may be set higher than previous goals, due to changes in work scope or mission. The INEL Radiological Control Performance Indicators consist of:

- Collective dose in person-rem.
- Average worker dose, maximum dose to a worker, and maximum neutron dose to a worker.
- The number of skin and clothing contaminations, including the number of contaminated wounds and facial contaminations.
- The number of radioactive material intakes resulting in a dose assessment of 10 mrem or more.
- The area of Contamination, High Contamination, and Airborne Radioactivity Areas in square feet.
- Airborne radioactivity events and spills.

These indicators also provide tracking and trending for the previous three years (where information is available). Other Radiological Control indicators suggested in the Radiological Control Manual are tracked and trended in other reports.

- The volume and radioactivity content of radioactive waste are reported by the Shipping and Material Management Department, found in the INEL Quarterly Waste Reduction Report and on the Radioactive Waste Management Information System (RWMIS).
- Releases of liquid and airborne radioactivity discharges are reported by the Environmental Protection Department in the INEL Environmental Monitoring Report and the INEL National Emission Standard for Hazardous Pollutants - Radionuclide Annual Report.

Radiological Control Performance Indicator Report Criteria

The INEL Radiological Control Performance Indicator Report is comprised of a description of the indicator and the criteria used for measurement.

Collective Radiation Dose -

The INEL collective total penetrating radiation exposure received and the associated quarterly and annual ALARA goals.

Average Worker Radiation Dose -

The average penetrating radiation dose based on collective dose and the total number of personnel receiving measured radiation exposure.

Maximum Radiation Dose to a Worker -

The highest penetrating radiation dose received by a worker at the INEL.

Maximum Neutron Dose to a Worker -

This indicator reports the highest neutron radiation dose received by a worker.

Number of Skin Contaminations -

The total number of radioactive skin contaminations and the number of those contaminations resulting in an Occurrence Report, the number of facial contaminations and the number of contaminated wounds.

Number of Clothing Contaminations -

The total number of radioactive clothing contaminations and the number of those contaminations resulting in an Occurrence Report.

Airborne Events -

The number of occupied facility areas not posted as Airborne Radioactivity Areas that exceed 10% of the Derived Air Concentrations (DAC).

Total Radiological Intakes -

The number of positive bioassay results that indicate an intake of radioactive material and result in a dose assessment of 10 mrem or more from an INEL occupational exposure. The total number of positive bioassays that resulted in an Occurrence Report and those that resulted in a dose assessment of 10 mrem or greater are tracked and trended.

Contamination Area -

The total area in square feet that falls within the description of a Contamination Area as defined in Table 2-3 of the INEL RCM.

High Contamination Area -

The total area in square feet that falls within the description of a High Contamination Area as defined in Table 2-3 of the INEL RCM.

Airborne Radioactivity Area -

The total area in square feet that falls within the description of an Airborne Radioactivity Area as defined in Table 2-3 of the INEL RCM.

Radioactive Spills -

The total number of radioactive spills at the INEL. A spill is considered an inadvertent loss or release of radioactive contamination outside a Radiologically Controlled Area.

INEL Collective Year-to-Date Penetrating Radiation Dose CY-96

The DOE and LMITCO policy is to maintain occupational radiation exposure ALARA. Measuring collective radiation exposure provides an indication of the effectiveness of the Radiological Control and ALARA Programs.

The ALARA goal for the INEL was adjusted to is 236.4 person-rem to provide realistic values. Changes in work scope result in reevaluations and adjustments in the yearly and quarterly ALARA goals.

The INEL Performance Indicators continue to reflect a challenging yet positive control of occupational radiation exposure. The collective radiation exposure through the end of the first quarter of CY-1996 was 49.9 person-rem. The collective exposure represents 84 percent of the first quarter ALARA goal.

INEL Year-to-Date Average Worker Dose CY-96

Tracking the average worker radiation exposure provides an indication of the effectiveness of the Radiological Control and ALARA Programs, and how well managers are managing their workers radiation exposure. Large increases are investigated, root causes determined and appropriate measures taken.

The average occupational radiation exposure for INEL workers at the end of the first quarter was 0.091 rem.

INEL Maximum Year-to-Date Penetrating Dose to a Worker CY-96

The maximum penetrating radiation dose to a worker provides another indication of how well worker radiation exposure is being controlled. Managers should use these reports as an aid in administration of their workers occupational radiation exposure.

The maximum penetrating radiation dose to a worker through the end of the first quarter of CY-1996 was 1.133 rem. This individual was involved in the NWCF Turnaround Project.

INEL Maximum Year-to-Date Neutron Dose to a Worker CY-96

Tracking the maximum neutron radiation dose to a worker provides an indication of how well worker exposure to neutron radiation is managed. Quality factors of neutron radiation are not as well known as those of alpha, beta, and gamma radiation. Neutron radiation is included in the total penetrating radiation dose, but is also tracked separately.

The INEL maximum neutron radiation dose to a worker through the end of the first quarter was 0.032 rem. This individual was involved in radiological work activities at TRA.

INEL Year-to-Date Skin Contaminations CY-96

Skin contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled.

There were five skin contaminations at the INEL through the end of the first quarter. All five resulted in ORs.

INEL Year-to-Date Clothing Contaminations CY-96

Clothing contamination events are a measure of the effectiveness of the radiological protection program, specifically how well radioactive contamination is controlled by safe radiological work practices.

There were 19 clothing contaminations at the INEL through the end of the first quarter. Ten events resulted in ORs, seven occurred at CPP, one at TRA and two at TAN.

INEL Year-to-Date Airborne Radioactivity Events CY-96

Air samplers monitor occupied facility areas to quantify concentrations of airborne radioactivity. The DOE unit of measure is a DAC. A DAC is the atmospheric concentration of a radionuclide which, if inhaled continually for one work year (2000 hours), would result in an internal dose of 5.0 rem Committed Effective Dose Equivalent (CEDE). An area which exceeds 10% of one DAC must be posted as an Airborne Radioactivity Area.

No airborne activity greater than 10% DAC was detected in areas not posted as Airborne Radioactivity Areas at the INEL during the first quarter.

INEL Year-to-Date Radioactive Material Intakes CY-96

This indicator depicts the total number of positive bioassay results that indicate an intake of radioactive material and result in an assigned CEDE of 10 mrem or greater.

The total number of positive bioassays resulting in a dose assessment of 10 mrem or more at the INEL through the first quarter was 10. Of these positive indications, none were reportable in accordance with DOE Order 5000.3B reportable criteria.

INEL Contamination Area

CY-96

This indicator is used to report the total area designated as Contamination Area as defined in Table 2-3 of the INEL RCM.

Area is reported in units of square feet. The reported areas are further separated into areas which are permanent and in-use. This establishes a baseline for future reporting and allows areas other than permanent and in-use to be evaluated for decontamination.

The total Contamination Area at the INEL at the end of the first quarter was 196,667 square feet. Of this area, 151,123 square feet was designated as permanent and in-use.

INEL High Contamination Area CY-96

This indicator is used to report the total area designated as High Contamination Area as defined in Table 2-3 of the INEL RCM.

Area is reported in units of square feet. The reported area is separated into areas which are permanent and in-use. This establishes a baseline for future reporting and allows areas other than permanent and in-use to be evaluated for decontamination.

The total High Contamination Area at the INEL at the end of the first quarter was 297,663 square feet. Of this area, 296,641 square feet was designated as permanent and in-use.

INEL Airborne Radioactivity Area CY-96

This indicator is used to report the total area designated as an Airborne Radioactivity Area as defined in Table 2-3 of the INEL RCM. These areas are reported in units of square feet. The reported areas are also separated into permanent and in-use areas. This establishes a baseline for future reporting and allows areas other than permanent and in-use to be evaluated for decontamination.

The total Airborne Radioactivity Area at the INEL at the end of the first quarter was 84,712 square feet. Of this area 83,662 square feet is designated as permanent and in-use.

INEL Year-to-Date Spills CY-96

This indicator is used to report inadvertent loss or release of radioactive material. It includes all events, as well as those losses or releases of radioactively contaminated material that meet DOE reportable criteria.

The INEL had twelve loss of radioactive materials or spills through the end of the first quarter. Four of the spills resulted in ORs. All twelve events occurred at CPP.

Central Facility Area

The CFA report also includes
other outlying area information

CFA Collective Year-to-Date Penetrating Radiation Dose CY-96

The collective occupational radiation exposure at CFA through the end of the first quarter was 0.562 person-rem.

Major activities contributing to CFA's total radiation exposure include Decontamination and Decommissioning (D&D) activities, Environmental Restoration (ER) Projects, environmental monitoring and facility maintenance.

CFA Year-to-Date Average Worker Dose CY-96

The average worker radiation exposure provides an indication of the effectiveness of the Radiological Control and ALARA Programs.

The average CFA worker occupational radiation exposure through the end of the first quarter was 0.014 rem. Major sources of exposure involved D&D and ER work activities.

CFA Maximum Year-to-Date Penetrating Dose to a Worker CY-96

The maximum penetrating radiation dose to a worker provides another indication of how well occupational radiation exposure is being managed.

The maximum penetrating radiation dose to a CFA worker through the end of the first quarter was 0.040 rem.

CFA Maximum Year-to-Date Neutron Dose to a Worker CY-96

The maximum neutron radiation dose to a worker provides an indication of how well occupational exposure to neutron radiation is managed.

The CFA maximum neutron radiation dose to a worker through the end of the first quarter was 0.030 rem.

CFA Year-to-Date Skin Contaminations CY-96

Skin contamination events are a measure of effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled.

There were no skin contaminations at the CFA areas during the first quarter.

CFA Year-to-Date Clothing Contaminations CY-96

Clothing contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled and how well workers adhere to safe radiological work practices.

There were no clothing contaminations at the CFA areas through the end of the first quarter.

**CFA Year-to-Date
Airborne Radioactivity Events
CY-96**

Air samplers monitor occupied facility areas to quantify concentrations of airborne radioactivity. The DOE unit of measure is a DAC. An area which exceeds 10% of one DAC must be posted as an Airborne Radioactivity Area.

No airborne activity greater than 10% DAC was detected at CFA during the first quarter.

CFA Year-to-Date Radioactive Material Intakes CY-96

This indicator depicts the number of positive bioassay results that indicate an intake of radioactive material and result in a dose assessment of 10 mrem or greater during radiological work activities.

There was one positive bioassay indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater at CFA during the first quarter.

CFA Contamination Area CY-96

This indicator is used to report the total area designated as Contamination Area as defined in Table 2-3 of the INEL RCM.

The total Contamination Area at CFA at the end of the first quarter was 17,105 square feet. None of this area was designated as permanent and in-use.

CFA High Contamination Area CY-96

This indicator is used to report the total area designated as High Contamination Area as described in Table 2-3 of the INEL RCM.

The total High Contamination Area at CFA at the end of the first quarter was 372 square feet. None of this area was designated as permanent and in-use.

CFA Airborne Radioactivity Area CY-95

This indicator is used to report the total area designated as Airborne Radioactivity Area as described in Table 2-3 of the INEL RCM.

The total Airborne Radioactivity Area at CFA at the end of the first quarter was zero square feet.

CFA Year-to-Date Spills CY-96

This indicator is used to report inadvertent loss or release of radioactive material.

CFA had no radioactive spills or loss of radioactive material during the first quarter.

Idaho Chemical Processing Plant

ICPP Collective Year-to-Date Penetrating Radiation Dose CY-96

The ICPP collective occupational radiation exposure through end of the first quarter was 40.6 person-rem.

Major contributors to the total penetrating radiation exposure received by personnel include the tank farm valve box upgrade, the NWCF turnaround, CPP-604 WL-101/102 maintenance activities and the VES-106 Liner Installation Project.

ICPP Year-to-Date Average Worker Dose CY-96

The average worker radiation exposure provides an indication of the effectiveness of the Radiological Control and ALARA Programs.

The average occupational radiation exposure for ICPP workers through the end of the first quarter was 0.143 rem.

ICPP Maximum Year-to-Date Penetrating Dose to a Worker CY-96

The maximum penetrating radiation dose to a worker provides another indication of how well occupational radiation exposure is being managed.

The maximum penetrating radiation dose to an ICPP worker through the end of the first quarter was 1.133 rem. This individual was involved in activities related to the NWCF turnaround project.

ICPP Maximum Year-to-Date Neutron Dose to a Worker CY-96

The maximum neutron radiation dose to a worker provides an indication of how well occupational exposure to neutron radiation is managed.

The ICPP maximum neutron radiation dose to a worker through the end of the first quarter was 0.019 rem.

ICPP Year-to-Date Skin Contaminations CY-96

Skin contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled.

Three skin contaminations occurred during the first quarter. All three events resulted in ORs. Detailed information is contained ID-LITC-WASTEMNGT-1996-0002, ID-LITC-WASTEMNGT-1996-0003 and ID-LITC-WASTEMNGT-1996-0005.

There was one facial contamination and no contaminated wounds at the ICPP during the first quarter.

ICPP Year-to-Date Clothing Contaminations CY-96

Clothing contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled and how well workers adhere to safe radiological work practices.

Fourteen clothing contaminations were reported during the first quarter at the ICPP. Seven events resulted in ORs. Detailed information is contained in ORs, ID-LITC-WASTEMNGT-1996-0001, ID-LITC-WASTEMNGT-1996-0002, ID-LITCO-FUELRCSTR-1996-0001, ID-LITC-WASTEMNGT-1996-0003, ID-LITCO-ID-LITC-WASTEMNGT-1996-1005.

ICPP Year-to-Date Airborne Radioactivity Events CY-96

Air samplers monitor occupied process and laboratory areas to quantify concentrations of airborne radioactivity. The DOE unit of measure is a DAC. An area which exceeds 10% of one DAC must be posted as an Airborne Radioactivity Area.

No airborne activity greater than 10% DAC was detected in ICPP areas not posted as Airborne Radioactivity Areas during the first quarter.

ICPP Year-to-Date Radioactive Material Intakes CY-96

This indicator depicts the number of positive bioassay results that indicate an intake of radioactive material and result in a dose assessment of 10 mrem or greater from an ICPP exposure during occupational work activities.

There were five positive bioassays indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater at the ICPP during the first quarter.

NOTE:

These positive bioassay results were assigned in February and March, however the actual intakes occurred in CY-1995.

ICPP Contamination Area CY-96

This indicator is used to report the total ICPP area designated as Contamination Area as defined in Table 2-3 of the INEL RCM.

The total Contamination Area at the ICPP at the end of the first quarter was 65,419 square feet. Of this area, 64,684 square feet was designated permanent and in-use.

ICPP High Contamination Area CY-96

This indicator is used to report the total ICPP area designated as High Contamination Area as defined in Table 2-3 of the INEL RCM.

The total High Contamination Area at the ICPP during the first quarter was 251,961 square feet. Of this area, 251,311 square feet was designated as permanent and in-use.

ICPP Airborne Radioactivity Area CY-96

This indicator is used to report the total ICPP area designated as Airborne Radioactivity Area as defined in Table 2-3 of the INEL RCM.

The total Airborne Radioactivity Area at the ICPP at the end of the first quarter was 82,712 square feet. Of this area, 82,062 square feet was designated as permanent and in-use.

ICPP Year-To-Date Spills CY-96

This indicator is used to report inadvertent loss or release of radioactive material.

The ICPP had 12 radioactive contaminated spills during the first quarter, of which four resulted in ORs. Detailed information is contained in ID-LITC-WASTEMNGT-1996-0001, ID-LITC-WASTEMNGT-0002, ID-LITC-WASTEMNGT-1996-0003, and ID-LITC-LANDLORD-1996-0007.

Power Burst Facility

Waste Reduction Operations
Complex

Waste Experimental Reduction Facility

PBF Collective Year-to-Date Penetrating Radiation Dose CY-96

PBF, WERF, and WROC collective radiation exposure through the end of the first quarter was 0.133 rem.

Major contributors to the first quarter occupational radiation exposure were the repackaging of mixed waste, sizing low level waste, waste inventory, and the receiving and shipping of mixed waste.

NOTE:

*Major radiological work activities for PBF are scheduled to begin in June.
 PBF - 0 person-rem / WROC - 0.133 person-rem*

PBF Year-to-Date Average Worker Dose CY-96

The average worker radiation exposure provides an indication of the effectiveness of the Radiological Control and ALARA Programs.

The average PBF/WERF/WROC worker radiation exposure at the end of the first quarter was 0.017 rem. The major sources of exposure were related to repackaging, sizing, shipping and receiving mixed waste.

PBF Maximum Year-to-Date Penetrating Dose to a Worker CY-96

The maximum penetrating radiation dose to a worker provides another indication of how well occupational radiation exposure is being managed.

The maximum penetrating radiation dose to a PBF/WERF/WROC worker through the end of the first quarter was 0.022 rem.

**PBF Maximum Year-to-Date
Neutron Dose to a Worker
CY-95**

The maximum neutron radiation dose to a worker provides an indication of how well occupational exposure to neutron radiation is managed.

The PBF/WERF/WROC maximum neutron radiation dose to a worker through the end of the first quarter was zero rem.

PBF Year-to-Date Skin Contaminations CY-96

Skin contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled.

There were no skin contaminations at PBF, WERF, or WROC during the first quarter.

PBF Year-to-Date Clothing Contaminations CY-96

Clothing contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled and how well workers adhere to safe radiological work practices.

There were no clothing contaminations at PBF, WERF, or WROC through the end of the first quarter.

PBF Year-to-Date Airborne Radioactivity Events CY-96

Air samplers monitor occupied process and laboratory areas to quantify concentrations of airborne radioactivity. The DOE unit of measure is a DAC. An area which exceeds 10% of one DAC must be posted as an Airborne Radioactivity Area.

No airborne activity greater than 10% DAC was detected at PBF, WERF, or WROC areas not posted as Airborne Radioactivity Areas during the first quarter.

PBF Year-to-Date Radioactive Material Intakes CY-96

This indicator depicts the number of positive bioassay results that indicate an intake of radioactive material and result in a dose assessment of 10 mrem or greater from a PBF, WERF, or WROC, during radiological work activities.

There were no positive bioassays indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater at PBF, WERF or WROC during the first quarter.

PBF Contamination Area CY-96

This indicator is used to report the total area designated as Contamination Area as defined in Table 2-3 of the INEL RCM.

The total Contamination Area at PBF, WERF, and WROC at the end of the first quarter was 7,378 square feet. All of this area was designated as permanent and in-use.

PBF High Contamination Area CY-96

This indicator is used to report the total area designated as High Contamination Area as defined in Table 2-3 of the INEL RCM.

The total High Contamination Area at PBF, WERF, and WROC at the end of the first quarter was 2,288 square feet. All of this area was designated as permanent and in-use.

PBF Airborne Radioactivity Area CY-96

This indicator is used to report the total area designated as Airborne Radioactivity Area as defined in Table 2-3 of the INEL RCM.

The total Airborne Radioactivity Area at PBF, WERF, and WROC at the end of the first quarter was 2,000 square feet. All of this area was designated as permanent or in-use.

PBF Year-to-Date Spills CY-96

This indicator is used to report inadvertent loss or release of radioactive material.

There were no radioactive contaminated spills at PBF, WERF, or WROC during the first quarter.

Radioactive Waste Management Complex

RWMC Collective Year-to-Date Penetrating Radiation Dose CY-96

The RWMC collective occupational exposure radiation exposure through the end of the first quarter was 1.340 person-rem. The ALARA goal for RWMC was adjusted from 21.5 to 11.9 person-rem.

The major contributors to the first quarter RWMC occupational radiation exposure were waste transfers to storage modules and low-level disposal operations.

RWMC Year-to-Date Average Worker Dose CY-96

The average worker radiation exposure provides an indication of the effectiveness of the Radiological Control and ALARA Programs.

The average RWMC occupational radiation exposure for workers through the end of the first quarter was 0.023 rem. The major sources of exposure involved waste transfers and low-level disposal operations.

**RWMC Maximum Year-to-Date
Penetrating Dose to a Worker
CY-96**

The maximum penetrating radiation dose to a worker provides another indication of how well occupational radiation exposure is being managed.

The maximum penetrating radiation dose to a worker at RWMC during the first quarter was 0.071 rem.

RWMC Maximum Year-to-Date Neutron Dose to a Worker CY-96

The maximum neutron radiation dose to a worker provides an indication of how well occupational exposure to neutron radiation is managed.

There was no neutron radiation dose attributed to work at RWMC during the first quarter.

RWMC Year-to-Date Skin Contaminations CY-96

Skin contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled.

There were no skin contaminations at RWMC during the first quarter.

RWMC Year-to-Date Clothing Contaminations CY-96

Clothing contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled and how well workers adhere to safe radiological work practices.

There were no clothing contaminations at RWMC through the end of the first quarter.

**RWMC Year-to-Date
Airborne Radioactivity Events
CY-96**

Air samplers monitor occupied process and laboratory areas to quantify concentrations of airborne radioactivity. The DOE unit of measure is a DAC. An area which exceeds 10% of one DAC must be posted as an Airborne Radioactivity Area.

No airborne activity greater than 10% DAC was detected at RWMC not posted as Airborne Radioactivity Area during the first quarter.

RWMC Year-to-Date Radioactive Material Intakes CY-96

This indicator depicts the number of positive bioassay results that indicate an intake of radioactive material and result in a dose assessment of 10 mrem or greater from RWMC radiological work activities.

There were no positive bioassays indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater at RWMC during the first quarter.

RWMC Contamination Area CY-96

This indicator is used to report the total area designated as Contamination Area as defined in Table 2-3 of the INEL RCM.

The total Contamination Area at RWMC at the end of the first quarter was zero square feet.

RWMC High Contamination Area CY-96

This indicator is used to report the total area designated as High Contamination Area as defined in Table 2-3 of the INEL RCM.

The total High Contamination Area at RWMC at the end of the first quarter was 29,525 square feet. All of this area was designated as permanent and in-use.

RWMC Airborne Radioactivity Area CY-96

This indicator is used to report the total area designated as Airborne Radioactivity Area as defined in Table 2-3 of the INEL RCM.

The total Airborne Radioactivity Area at RWMC at the end of the first quarter was zero square feet.

RWMC Year-to-Date Spills CY-96

This indicator is used to report inadvertent loss or release of radioactive material.

RWMC had no radioactive contaminated spills through the end of the first quarter.

Test Reactor Area

TRA Collective Year-to-Date Penetrating Radiation Dose CY-96

The TRA collective occupational radiation exposure through the end of the first quarter was 4.658 rem.

The major contributors to the first quarter TRA penetrating radiation exposure were ATR outages and normal reactor operations.

TRA Year-to-Date Average Worker Dose CY-96

The average worker radiation exposure provides an indication of the effectiveness of the Radiological Control and ALARA Programs.

The average TRA occupational radiation exposure at the end of the first quarter was 0.034 rem. The major sources of exposure were related to ATR outages and normal reactor operations.

TRA Maximum Year-to-Date Penetrating Dose to a Worker CY-96

The maximum penetrating radiation dose to a worker provides another indication of how well occupational radiation exposure is being managed.

The maximum penetrating radiation dose to a TRA worker through the end of the first quarter was 0.213 rem.

TRA Maximum Year-to-Date Neutron Dose to a Worker CY-96

The maximum neutron radiation dose to a worker provides an indication of how well occupational exposure to neutron radiation is managed.

The TRA maximum neutron radiation dose to a worker through the end of the first quarter was 0.032 rem.

TRA Year-to-Date Skin Contaminations CY-96

Skin contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled.

There were no skin contaminations at TRA during the first quarter.

TRA Year-to-Date Clothing Contaminations CY-96

Clothing contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled and how well workers adhere to safe radiological work practices.

There were two clothing contaminations at TRA during the first quarter, both resulted in an OR. Detailed information is contained in ID-LITC-TRA-1996-0001.

**TRA Year-to-Date
Airborne Radioactivity Events
CY-96**

Air samplers monitor occupied process and laboratory areas to quantify concentrations of airborne radioactivity. The DOE unit of measure is a DAC. An area which exceeds 10% of one DAC must be posted as an Airborne Radioactivity Area.

No airborne activity greater than 10% DAC was detected at TRA in areas not posted as Airborne Radioactivity Areas during the first quarter.

TRA Year-to-Date Radioactive Material Intakes CY-96

This indicator depicts the number of positive bioassay results that indicate an intake of radioactive material and result in a dose assessment of 10 mrem or greater from a TRA exposure during occupational work activities.

There were no positive bioassays indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater at TRA during the first quarter.

TRA Contamination Area CY-96

This indicator is used to report the total area designated as Contamination Area as defined in Table 2-3 of the INEL RCM.

The total Contamination Area at TRA at the end of the first quarter was 52,516 square feet, of which 25,619 square feet was designated as permanent and in-use.

TRA High Contamination Area CY-96

This indicator is used to report the total area designated as High Contamination Area as defined in Table 2-3 of the INEL RCM.

The total High Contamination Area at TRA at the end of the first quarter was 1,991 square feet. All of this area was designated as permanent and in-use.

TRA Airborne Radioactivity Area CY-96

This indicator is used to report the total area designated as Airborne Radioactivity Area as defined in Table 2-3 of the INEL RCM.

The total Airborne Radioactivity Area at TRA at the end of the first quarter was zero square feet.

TRA Year-to-Date Spills CY-96

This indicator is used to report inadvertent loss or release of radioactive material.

There were no reportable radioactive contaminated spills during the first quarter at TRA.

Test Area North/
Specific Manufacturing Capability

TAN/SMC Collective Year-to-Date Penetrating Radiation Dose CY-96

TAN and SMC collective occupational radiation exposure through the end of the first quarter was 2.417 person-rem.

Major contributors to the penetrating radiation at TAN and SMC were from storage of DRCT containers, handling and shipment preparation of DRCT fuel assembly containers and routine radiological work activities.

TAN/SMC Year-to-Date Average Worker Dose CY-96

The average worker radiation exposure provides an indication of the effectiveness of the Radiological Control and ALARA Programs.

The average TAN/SMC occupational radiation exposure through the end of the first quarter was 0.064 rem.

TAN/SMC Maximum Year-to-Date Penetrating Dose to a Worker CY-96

The maximum penetrating radiation dose to a worker provides another indication of how well occupational radiation exposure is being managed.

The maximum penetrating radiation dose to a TAN/SMC worker through the the end of the first quarter was 0.299 rem.

TAN/SMC Maximum Year-to-Date Neutron Dose to a Worker CY-96

The maximum neutron radiation dose to a worker provides an indication of how well occupational exposure to neutron radiation is managed.

The TAN/SMC maximum neutron radiation dose to a worker through the end of the first quarter was zero rem.

TAN/SMC Year-to-Date Skin Contaminations CY-96

Skin contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled.

There were two skin contaminations at TAN/SMC during the first quarter, both resulted in an OR. Detailed information is contained in the OR EDF-TAN-008.

Two facial contaminations resulted from a contaminated water spray. There were no contaminated wounds.

TAN/SMC Year-to-Date Clothing Contaminations CY-96

Clothing contamination events are a measure of the effectiveness of the radiological protection program, specifically, how well radioactive contamination is controlled and how well workers adhere to safe radiological work practices.

There were two clothing contaminations at TAN/SMC during the first quarter which resulted in an OR. Detailed information is contained in EDF-TAN-008.

TAN/SMC Year-to-Date Airborne Radioactivity Events CY-96

Air samplers monitor occupied process and laboratory areas to quantify concentrations of airborne radioactivity. The DOE unit of measures is a DAC. An area which exceeds 10% of one DAC must be posted as an Airborne Radioactivity Area.

No airborne activity greater than 10% DAC was detected at TAN/SMC areas not posted as Airborne Radioactivity Areas during the first quarter.

TAN/SMC Year-to-Date Radioactive Material Intakes CY-96

This indicator depicts the number of positive bioassay results that indicate an intake of radioactive material and result in a dose assessment of 10 mrem or greater from TAN/SMC exposure during occupational work activities.

There were four positive bioassays indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater through the end of the first quarter at TAN/SMC. None of the positive bioassays were reportable in accordance with DOE Order 5000.3B criteria.

TAN/SMC Contamination Area CY-96

This indicator is used to report the total area designated as Contamination Area as defined in Table 2-3 of the INEL RCM.

The total Contamination Area at TAN/SMC at the end of the first quarter was 54,249 square feet. Of this area, 53,949 square feet were designated as permanent and in-use.

TAN/SMC High Contamination Area CY-96

This indicator is used to report the total area designated as High Contamination Area as defined in Table 2-3 of the INEL RCM.

The total High Contamination Area at TAN/SMC at the end of the first quarter was 11,526 square feet. All of this area was designated as permanent and in-use.

TAN/SMC Airborne Radioactivity Area CY-96

This indicator is used to report the total area designated as Airborne Radioactivity Area as defined in Table 2-3 of the INEL RCM.

The total Airborne Radioactivity Area at TAN/SMC at the end of the first quarter was zero square feet.

TAN/SMC Year-to-Date Spills CY-96

This indicator is used to report inadvertent loss or release of radioactive material.

There was no loss of radioactive material at TAN/SMC during the first quarter.