LBL-PUB--695

DE92 010294

Performance Indicators

Third Quarter CY-1991

Lawrence Berkeley Laboratory

January 1, 1992

CONTENTS

1. Management Summary 1-1

1.1 Overview

1.2 Performance Initiatives

1.3 Good Practices

2. Performance Indicator Summary Charts 2-1

Appendices

A1. Summary by Performance Indicator A1-1

A2. Performance Indicator Charts

1.0 Personnel Safety ..... PI 1.1 Page 1

2.0 Operational Incidents ..... PI 2.1 Page 1

3.0 Environmental Releases (Normal Operations) ..... PI 3.1 Page 1

4.0 Management ..... PI 4.1 Page 1

A3. Performance Indicator Definitions A3-1

A4. Root Cause Narratives A4-1

A5. Errata A5-1

1. Management Summary

1.1 Overview

This Performance Indicator Report represents a compilation of data for the third quarter of calendar year 1991 (i.e., July 1 through September 30, 1991) for the following Lawrence Berkeley Laboratory (LBL) facilities:

(1) Bevalac
(2) 88-Inch Cyclotron
(3) Materials Sciences Division

Since this is only the third report generated, the data presented - three points on each chart - is not sufficient to make a conclusive trend analysis or qualitative evaluation regarding the performances of the above facilities.

In some cases trends are becoming recognizable. As data is accumulated in the next period a more definite description of performance can be presented.

1.2 Performance Initiatives

LBL will have a permanent employee assigned responsibility for this report in place prior to the submittal of the fourth quarter data report on March 1, 1992.

The present computer program being utilized for the Performance Indicator Report is being evaluated and refined as necessary to provide a product that will be useful to LBL and DOE operations.

Data acquisition and entry procedures will also be reviewed for effectiveness.

1.3 Good Practices

Increased emphasis on preventive and periodic maintenance is essential to reduce backlogs and ensure operational effectiveness.

The necessity to develop, implement, and comply with established procedures is evident.

Originating and maintaining adequate facility and utility drawings and related documentation is essential to safe construction and modification activities.

Training and certification of personnel on a periodic basis needs to be provided even for the most experienced individuals.

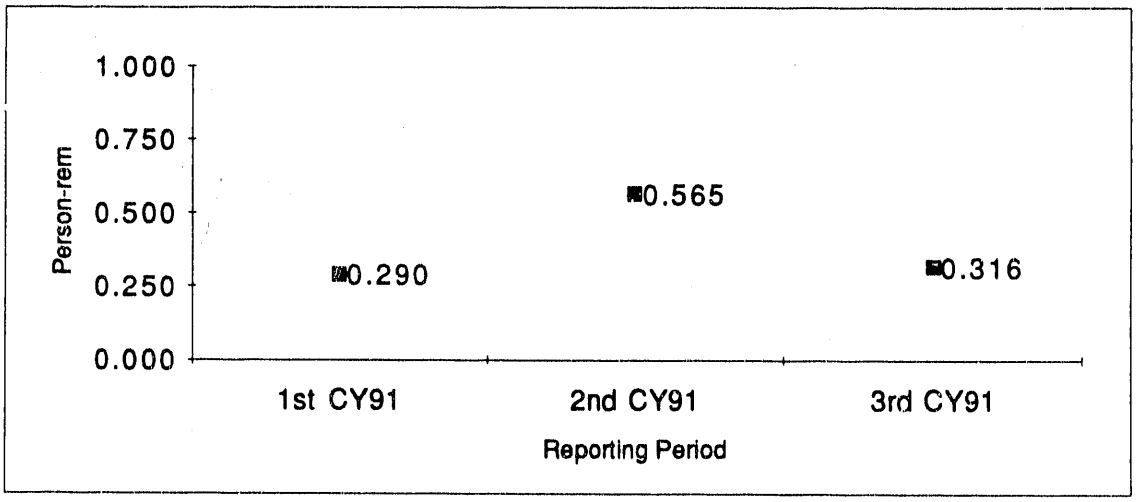
2. Performance Indicator Summary Charts

The following charts provide a summary of the performance indicator data provided for the Third Quarter of Calendar Year 1991. More detailed data on each performance indicator is provided in Appendix 2 of this report.

1.0 Personnel Safety

1.1 Collective Radiation Dose

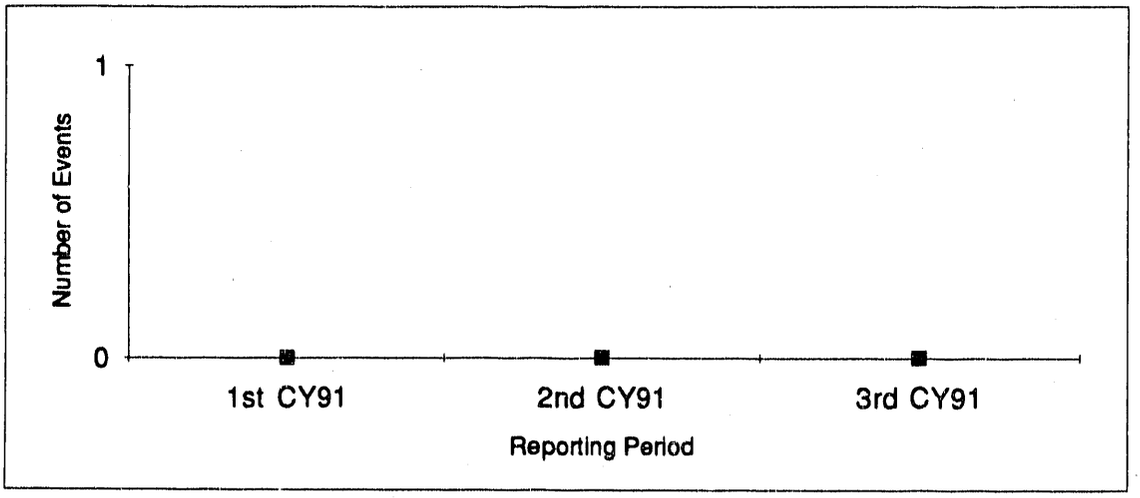
The total external whole-body dose (deep and shallow) received by all facility personnel (including subcontractors and visitors) as measured by the primary dosimeter, i.e., thermoluminescent dosimeter (TLD), or film badge. Exposure measured by direct reading dosimeters should be included only for those periods or situations when more accurate data are not available. Collective radiation dose is reported in units of person-rem.



Collective radiation doses remain well below permitted levels.

1.2 Skin Contaminations

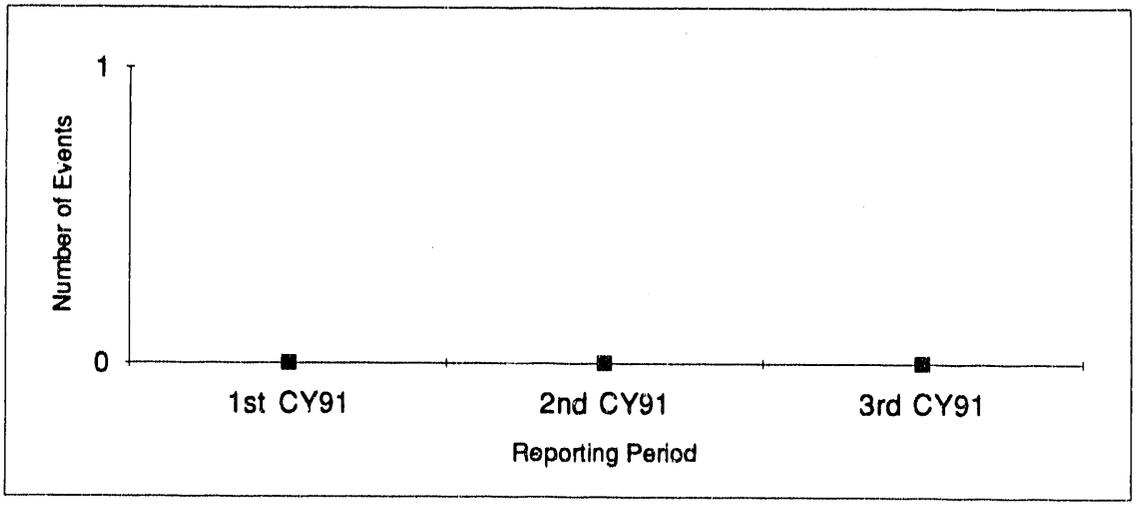
The total number of confirmed skin and personal clothing contaminations for all facility personnel, including subcontractors and visitors. Skin or clothing contamination due to radioactive noble gases or naturally occurring radon gas are not included.



There have been no skin contamination incidents to date.

1.3 Internal Contaminations

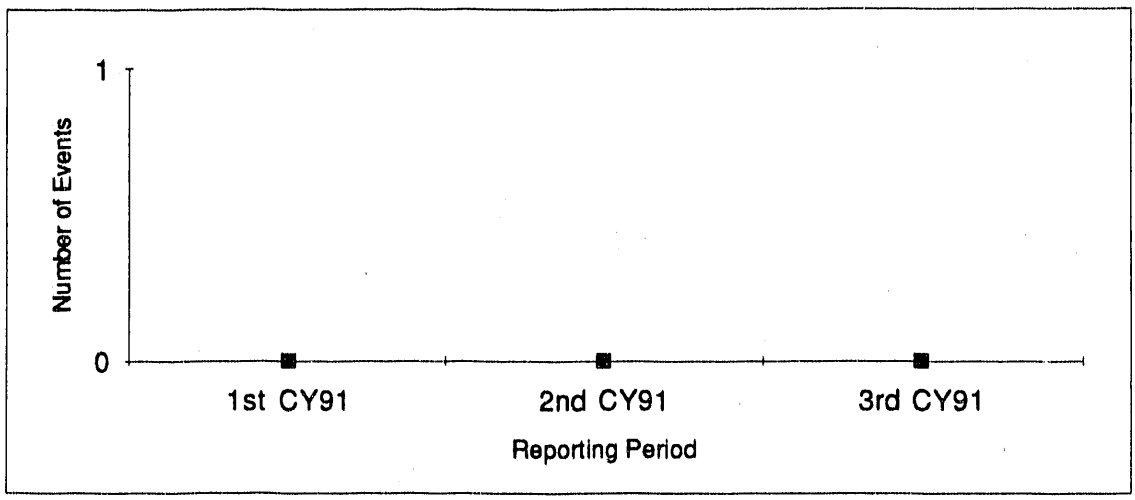
The total number of confirmed intakes of radioactive material for all facility personnel, including subcontractors and visitors, occuring during the reporting period.



There have been no internal contaminations to date.

1.4 Radioactive or Hazardous Material Overexposures

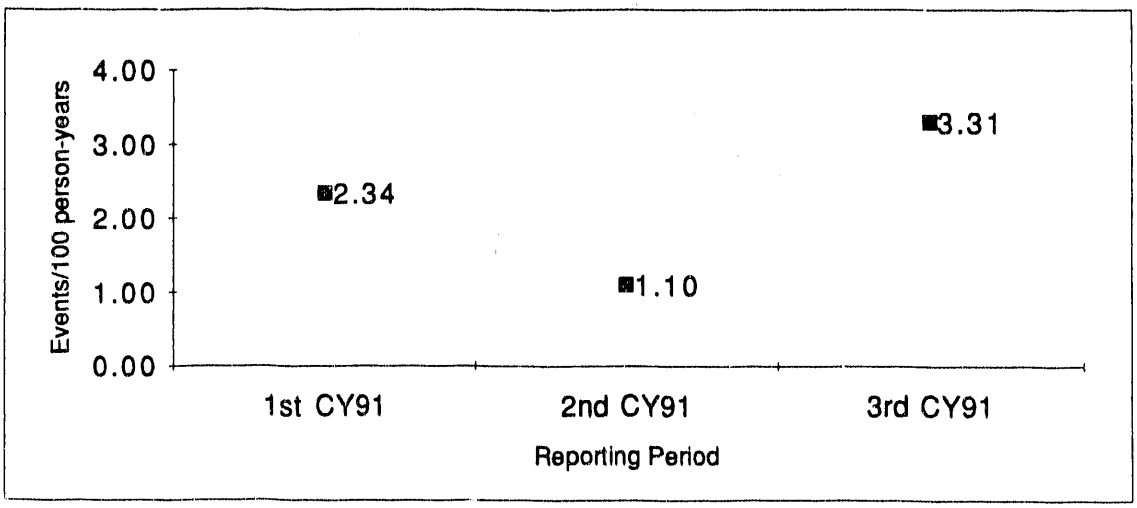
The number of reportable occurrences resulting from a personnel exposure (for all facility personnel, including subcontractors and visitors) to radioactive or hazardous materials in excess of limits established in DOE Orders.



There have been no overexposures to radioactive or hazardous materials to date.

1.5 Lost Work Day Cases (Lost Time Accident Rate)

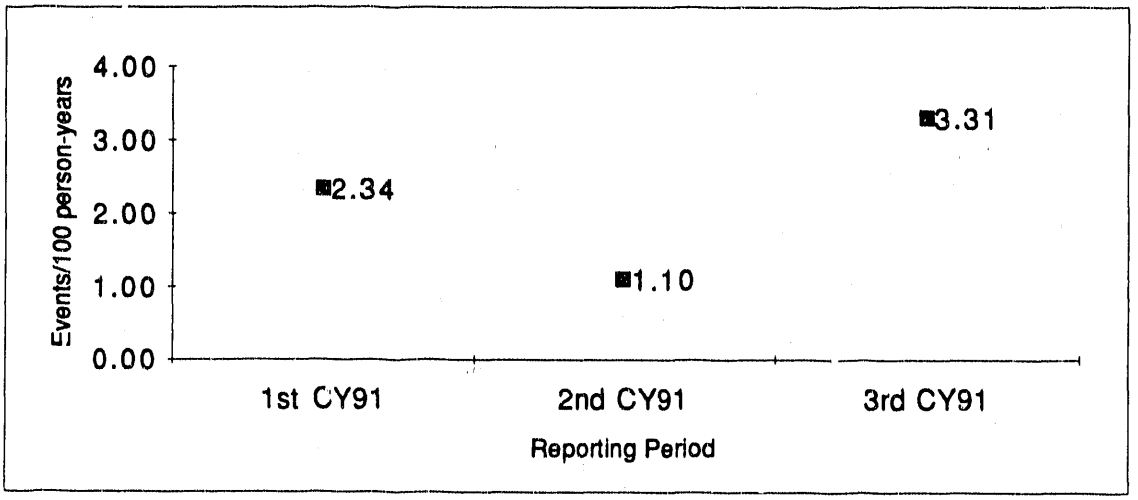
Number of incidents for all facility personnel involving days away from work per 100 person-years (200,000 person-hours) worked.



Although at a three quarter high, the lost time accident rate remains acceptable for the calendar year.

1.6 Recordable Injuries/Illnesses Rate

Total number of injuries or illness instances resulting from on-the-job activities that are recordable in accordance with OSHA Standards, per 100 person-years (200,000 person-hours) worked.

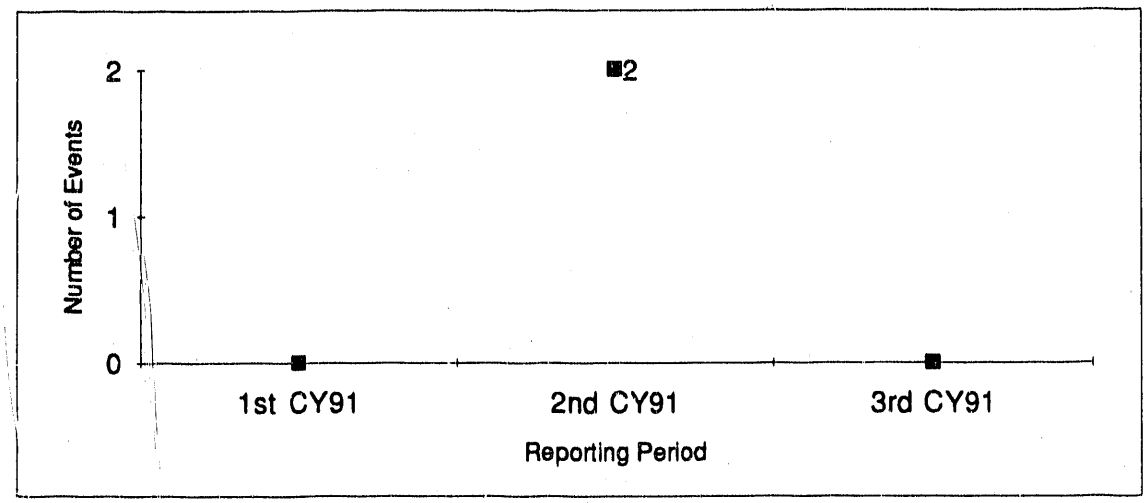


Although at a three quarter high, the recordable injuries/illnesses rate remains acceptable for the calendar year.

2.0 Operational Incidents

2.1 Environmental Incidents

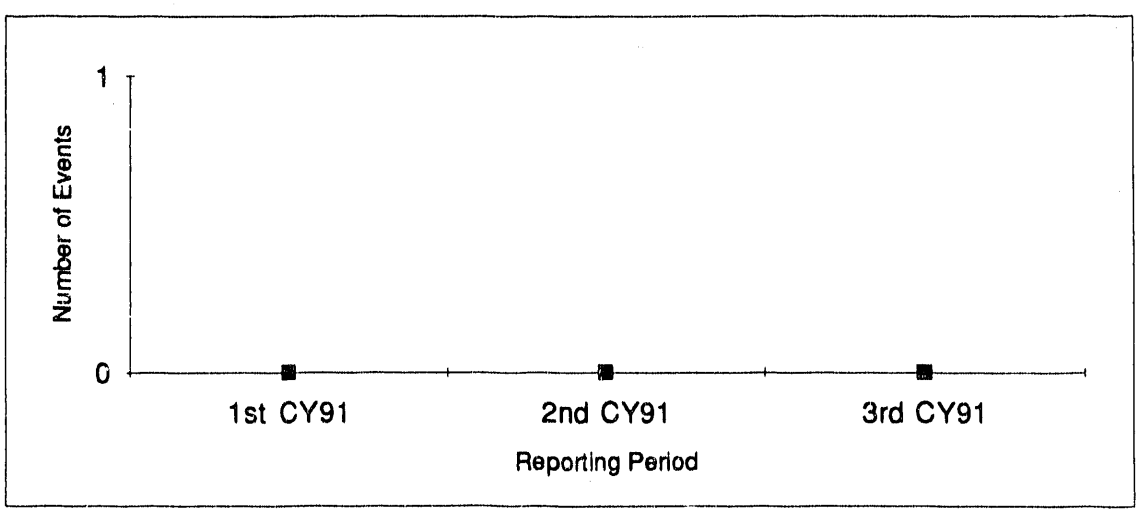
The number of reportable occurrences, both on-site and off-site, involving an inadvertent radioactive or hazardous material spill or release.



To date, only two minor environmental incidents have occurred at LBL's facilities this calendar year. Both of these occurred in the second quarter of 1991.

2.2 Unplanned Safety Function Actuations

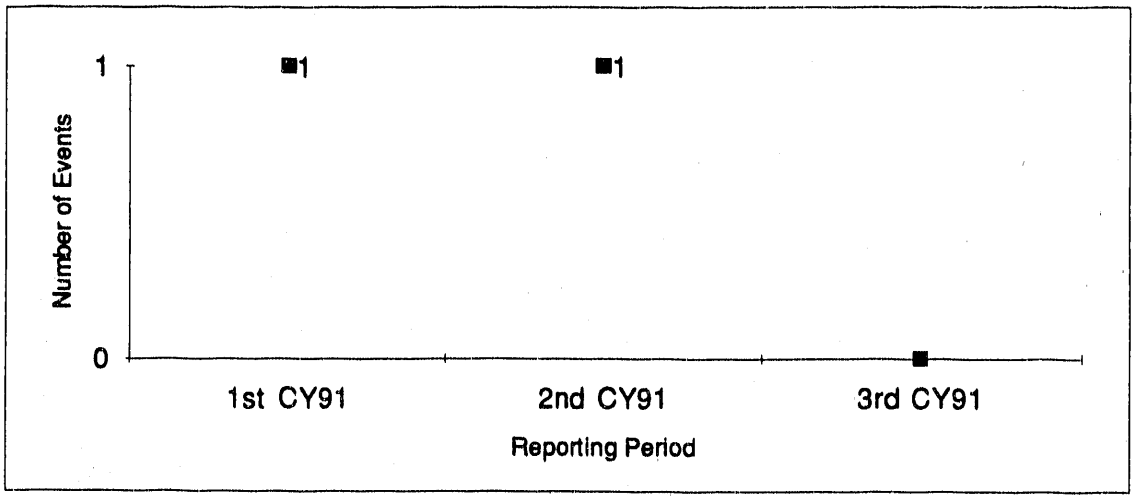
The number of unplanned actuations of any safety function or facility safety systems that occur when an actuation setpoint for a safety fuction is reached or when a spurious or inadvertent signal is generated, and major equipment is actuated or demanded. Unplanned means that the actuation was not part of a planned test or evolution.



There have been no unplanned safety function actuations during CY-1991.

2.3 Violations of Operating Procedures

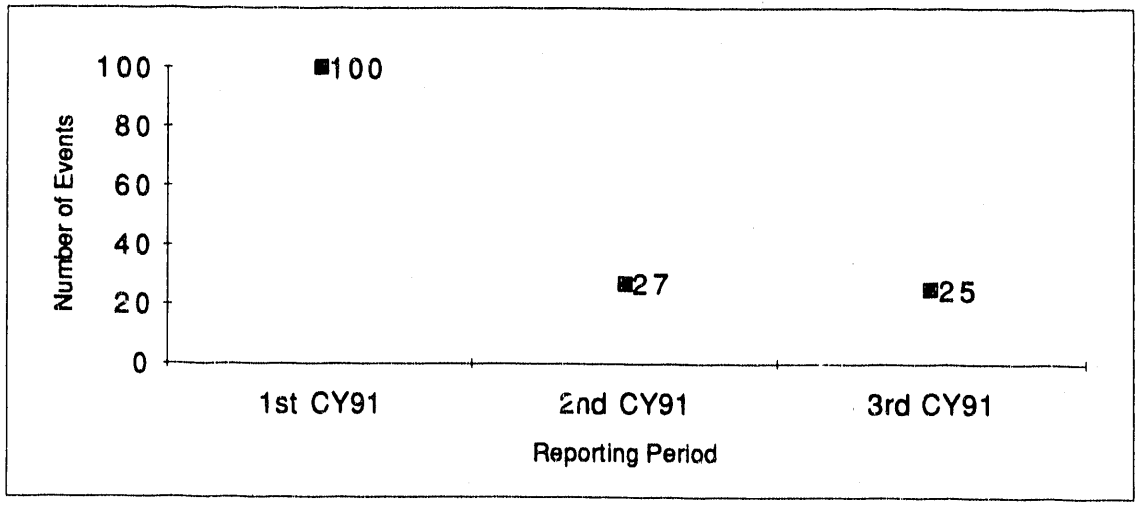
The number of instances where a failure of personnel to follow operating procedures resulted in a reportable occurrence.



After having one violation of operating procedures in each of the first two quarters, there were none in the current reporting period.

2.4 OSHA Violations

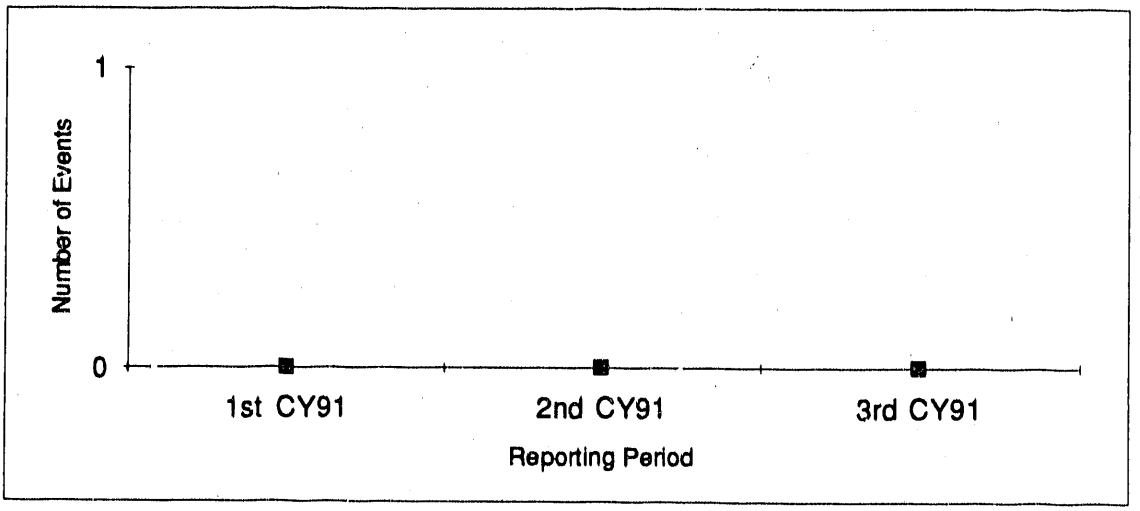
The total number of items of noncompliance with OSHA standards.



The number of OSHA violations continues to be much lower than in the first quarter, although still greater than desirable.

2.5 Unplanned Shutdowns

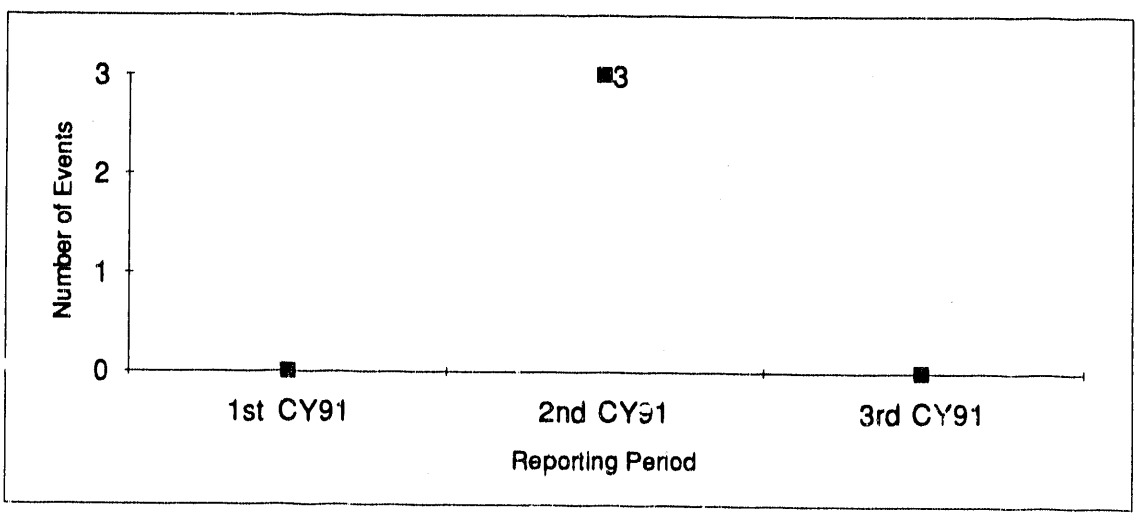
The number of unscheduled shutdowns of a facility, process or operation.



There have been no unplanned shutdowns to date for CY-1991.

2.6 Emergency and Unusual Occurrences

The number of Emergency and Unusual Occurrences reported in accordance with DOE Order 5000.3A, "Occurrence Reporting and Processing of Operations Information."

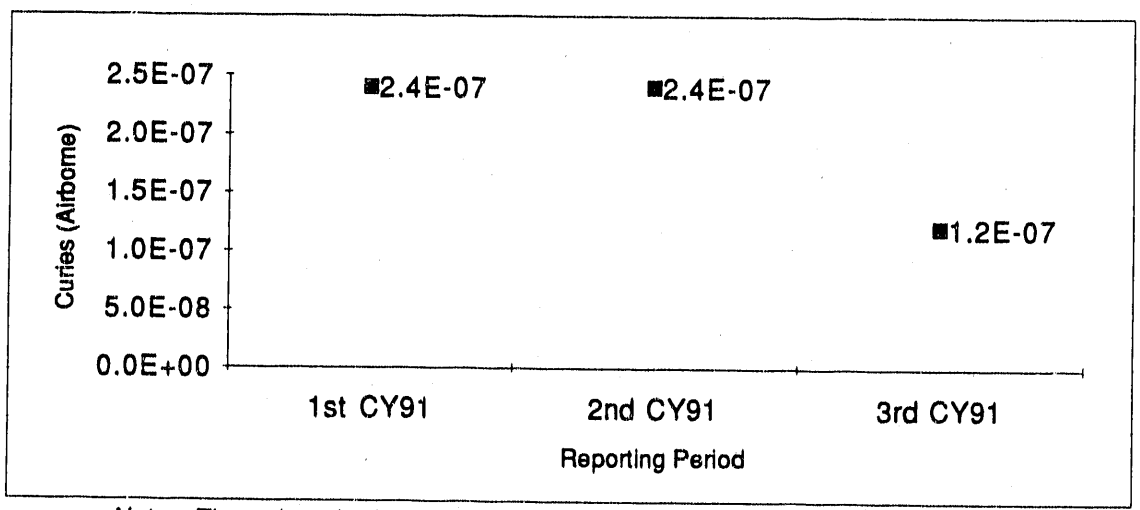


Despite having three unusual occurrences in the second quarter, there were none in the current reporting period.

3.0 Environmental Releases (Normal Operations)

3.1.1 Radionuclide Effluent Releases (Airborne)

Airborne releases to the environment, as measured at the point of release, for the following radionuclides: plutonium, uranium, nobel gases, particulates (including radiocesiums and radiostrontium, and activation products), radioiodine, tritium, and other actinides.

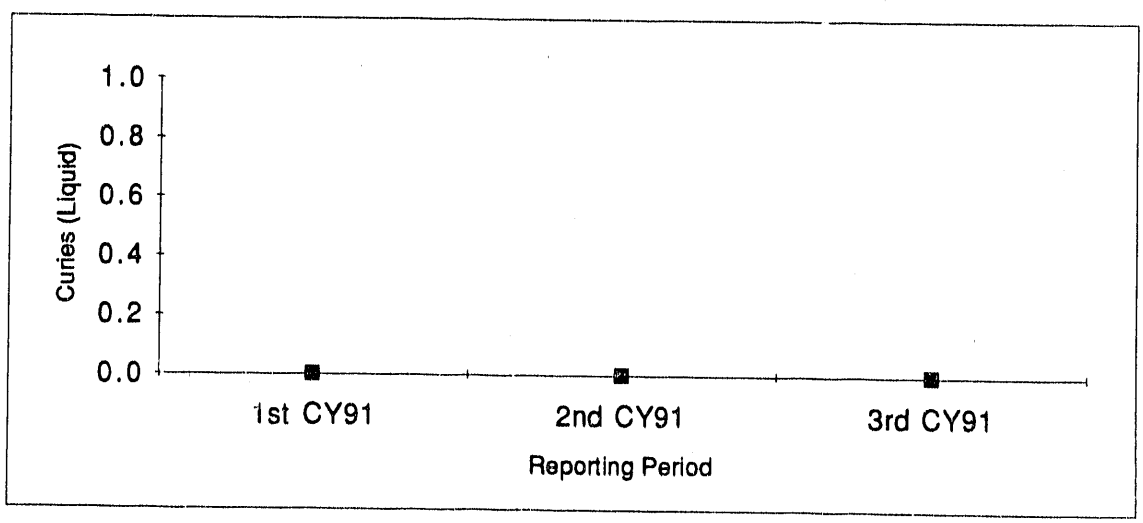


Note: The values in the chart depict upper bounds on the amounts released.

The amounts of airborne radionuclide effluent releases remains negligible.

3.1.2 Radionuclide Effluent Releases (Liquid)

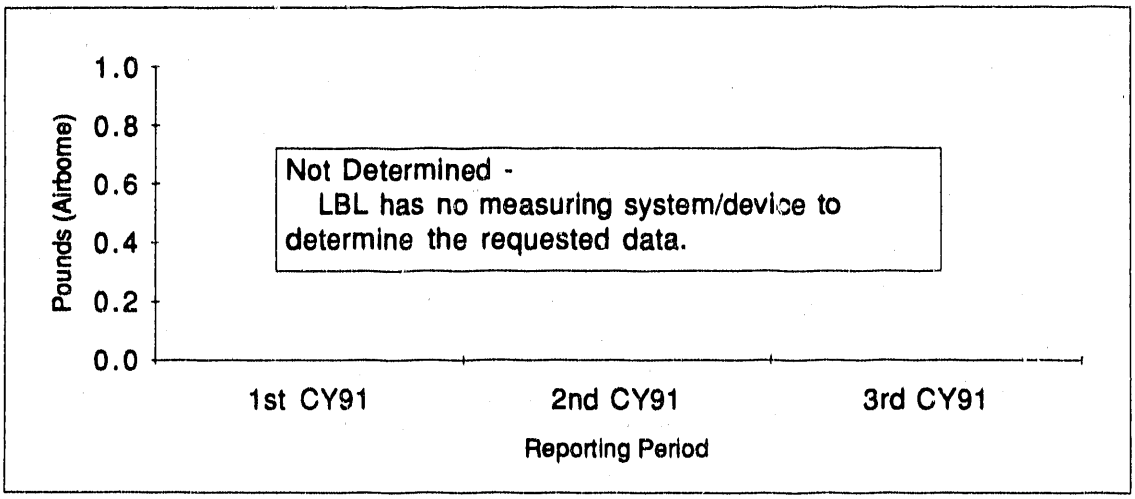
Liquid releases to the environment, as measured at the point of release, for the following radionuclides: plutonium, uranium, nobel gases, particulates (including radiocesiums and radiostrontium, and activation products), radioiodine, tritium, and other actinides.



There have been no liquid radionuclide effluent releases to date.

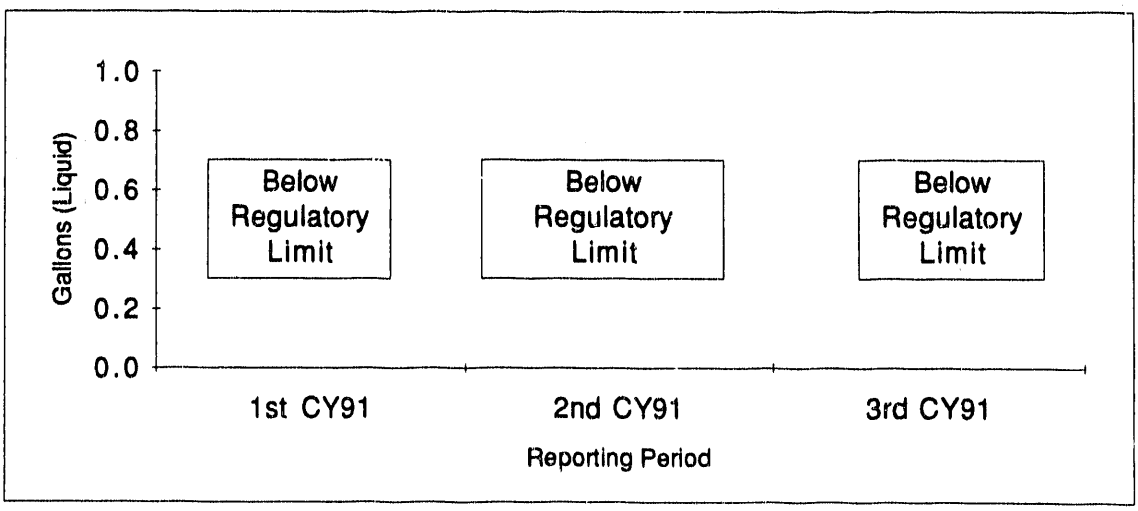
3.2.1 Hazardous Substance/Regulated Pollutant Effluent Release (Airborne)

The amount of "permitted" airborne non-radioactive releases. All hazardous substances and regulated pollutants that are listed in permits (e.g., Clean Air Act or NPDES permits) or otherwise reported to regulators (e.g., through SARA Title III, Section 313 reporting requirements) are included. Data shall be cumulative over the reporting period and reported in units of pounds.



3.2.2 Hazardous Substance/Regulated Pollutant Effluent Releases (Liquid)

The amount of "permitted" liquid non-radioactive releases. (See 3.2.1 for included substances). Data shall be cumulative over the reporting period and reported in units of gallons.

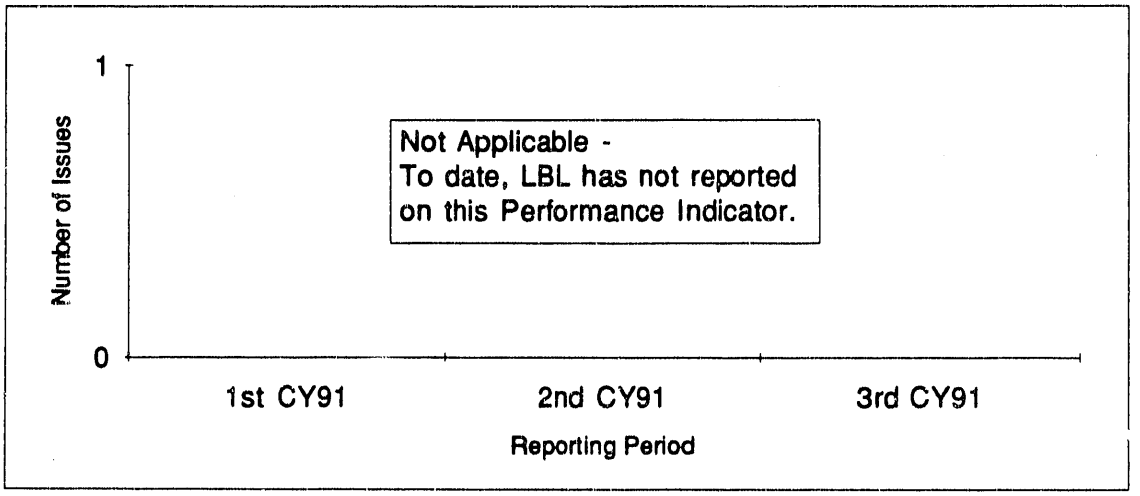


To date, the amounts of liquid hazardous substances and/or regulated pollutants released have been below regulatory limits.

4.0 Management

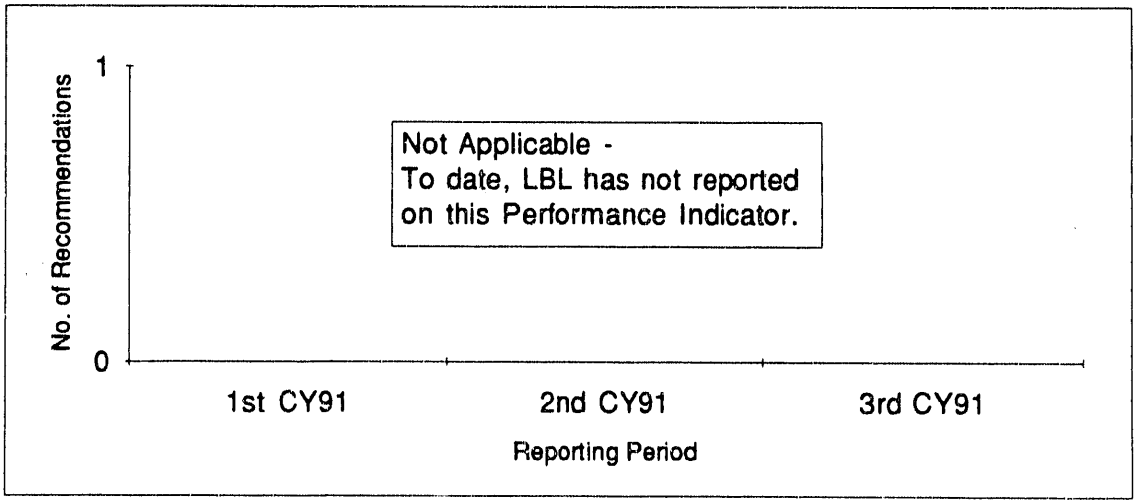
4.1 Open DOE Audit Issues

The total number of findings, including concerns and recommendations requiring corrective actions, by oversight assessments and line program self-assessments for which contractor corrective actions have not been completed at the time of the report.



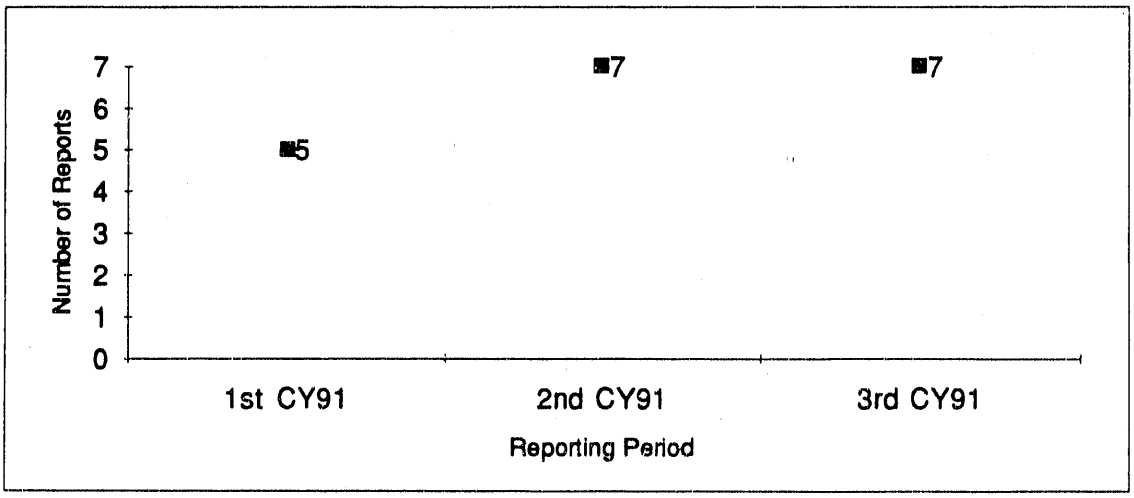
4.2 Open External Organization Recommendations

The total number of recommendations by external organizations, such as the Advisory Committee on Nuclear Facility Safety, the Defense Nuclear Facility Safety Board, the National Academy of Sciences, etc., directed to specific contractors or their facility operations, for which contractor corrective actions have not been completed at the time of the report.



4.3 Occurrence Reports with Open Corrective Actions

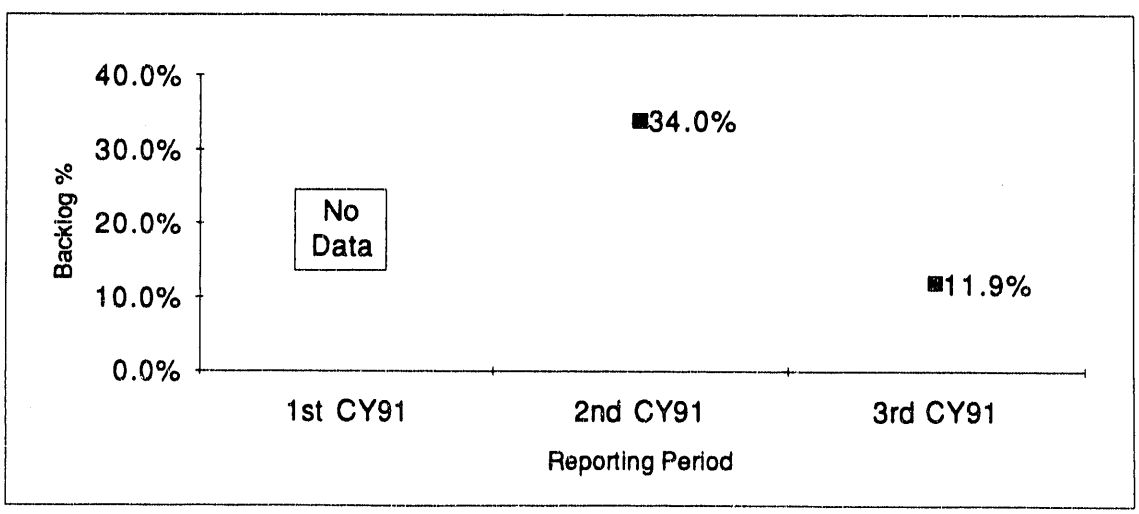
The number of Final Occurrence Reports for which all corrective actions have not been completed at the time of the report.



The number of Final Occurrence Reports with open corrective actions has remained relatively constant over the three reporting quarters.

4.4 Corrective Maintenance Backlog

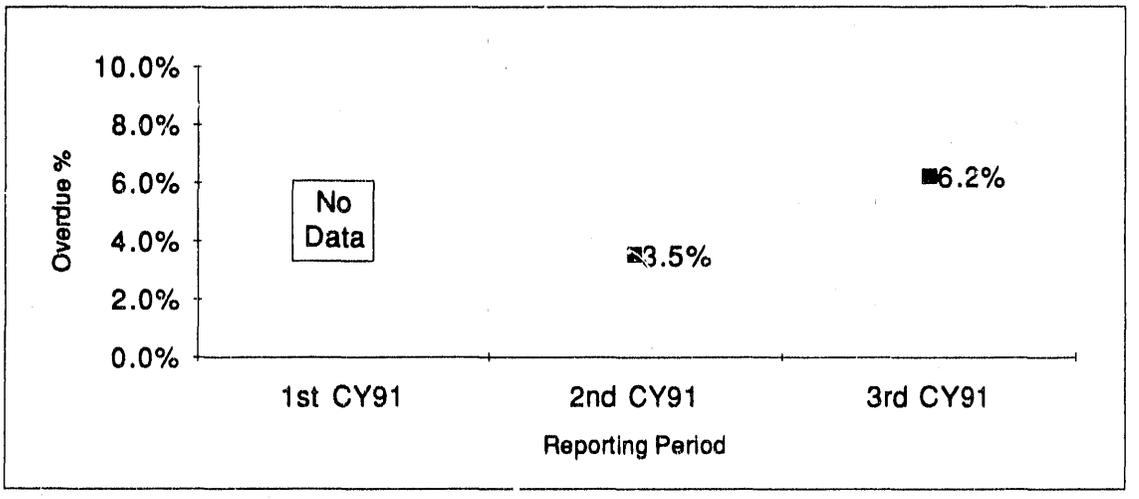
The percentage of open corrective maintenance work requests, including those requiring facility or process shutdown, that are greater than three months old at the end of the reporting period. Corrective maintenance may include minor modifications if performed under a corrective maintenance work request.



The corrective maintenance backlog was considerably reduced from the second to the third quarter.

4.5 Preventive Maintenance Overdue

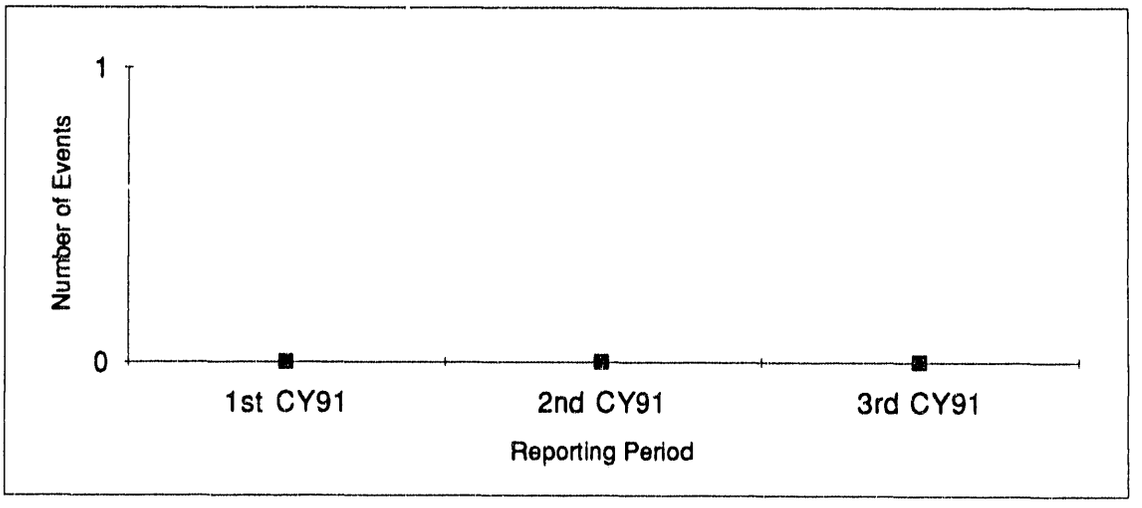
The percentage of preventive maintenance items that were not completed within the originally scheduled interval.



Although the percentage of preventive maintenance overdue rose from the second to the third quarter, the percent overdue remains relatively low.

4.6 Substance Abuse Incidents

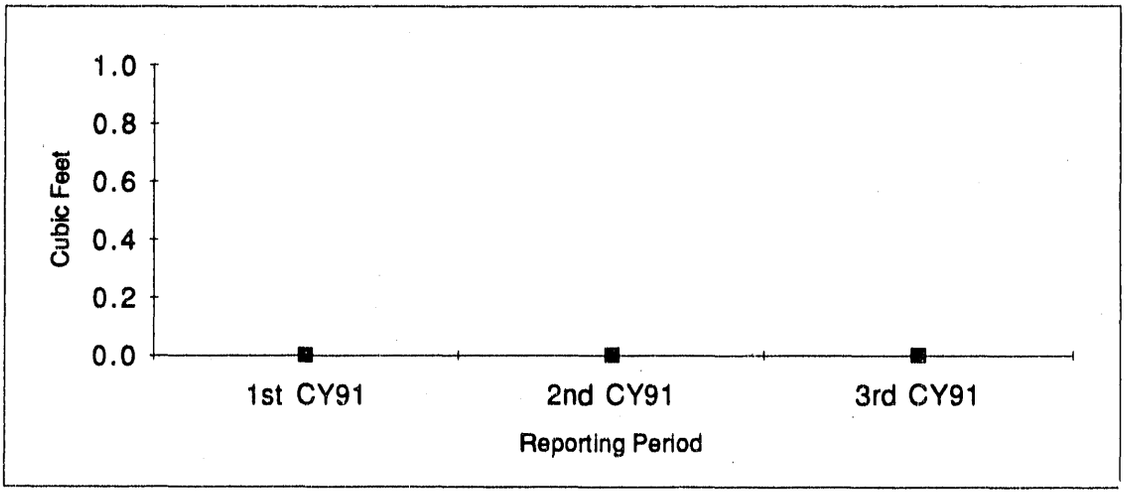
The number of reportable occurrences involving personnel use, possession or involvement of/with controlled substances, e.g., drugs, alcohol, etc.



There have been no substance abuse incidents to date.

4.7.1.1 Solid Low Level Radioactive Waste - Generated

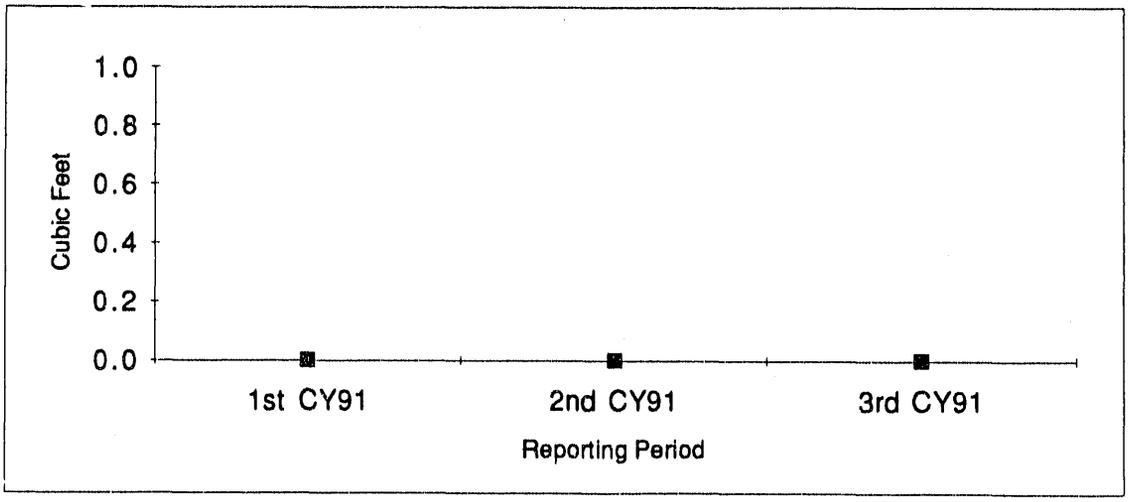
The total volume, in cubic feet, of solid low level radioactive waste generated during the reporting period.



There has been no radioactive waste generated to date for CY-1991.

4.7.1.2 Solid Low Level Radioactive Waste - Ready to Ship

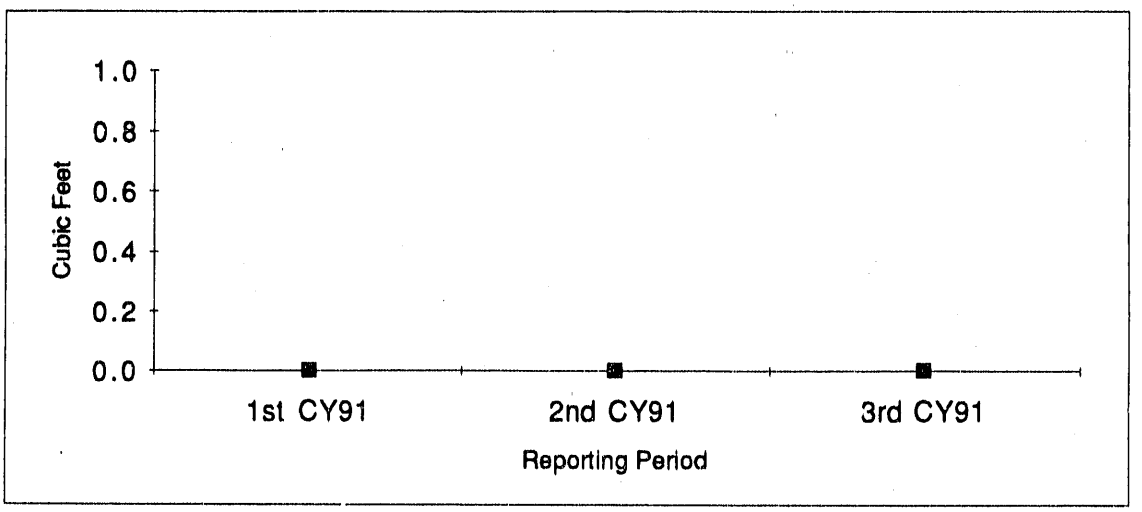
The total volume, in cubic feet, of the final form (pending shipment) of solid low level radioactive waste generated during the reporting period.



There has been no radioactive waste generated (hence, prepared to ship) during CY-1991.

4.7.1.3 Solid Low Level Radioactive Waste - Shipped

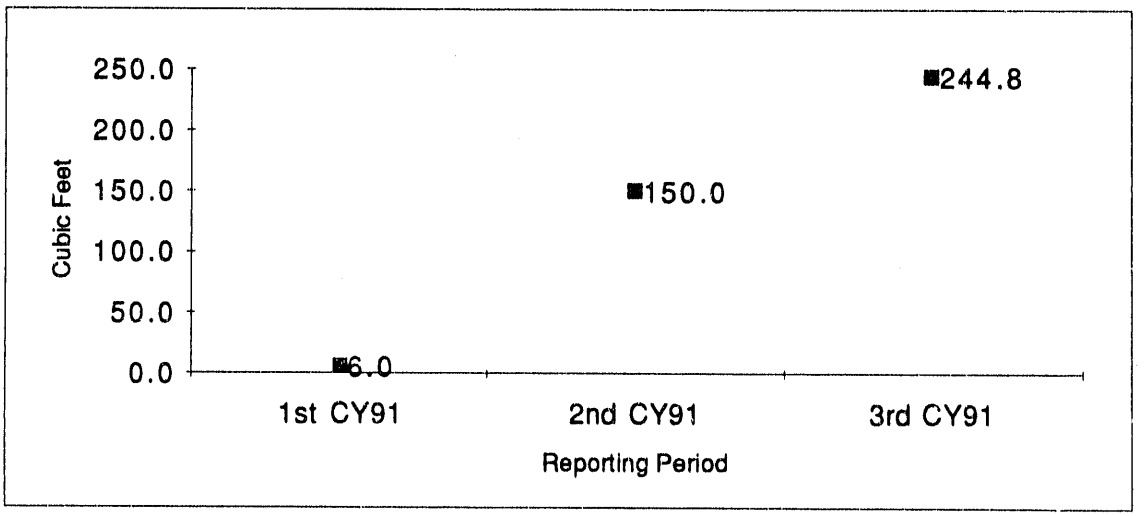
The total volume, in cubic feet, of solid low level radioactive waste shipped during the reporting period.



There has been no radioactive waste generated (hence, shipped) to date.

4.7.2.1 Solid Low Level Hazardous Waste - Generated

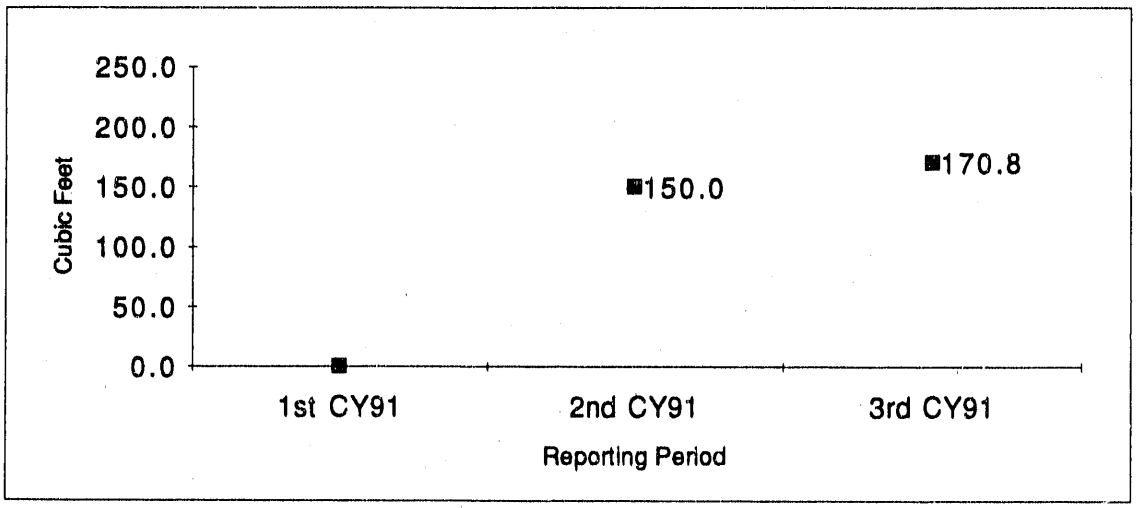
The total volume, in cubic feet, of solid hazardous waste generated during the reporting period.



The amount of low-level hazardous waste generated has risen steadily over the past three quarters.

4.7.2.2 Solid Low Level Hazardous Waste - Ready to Ship

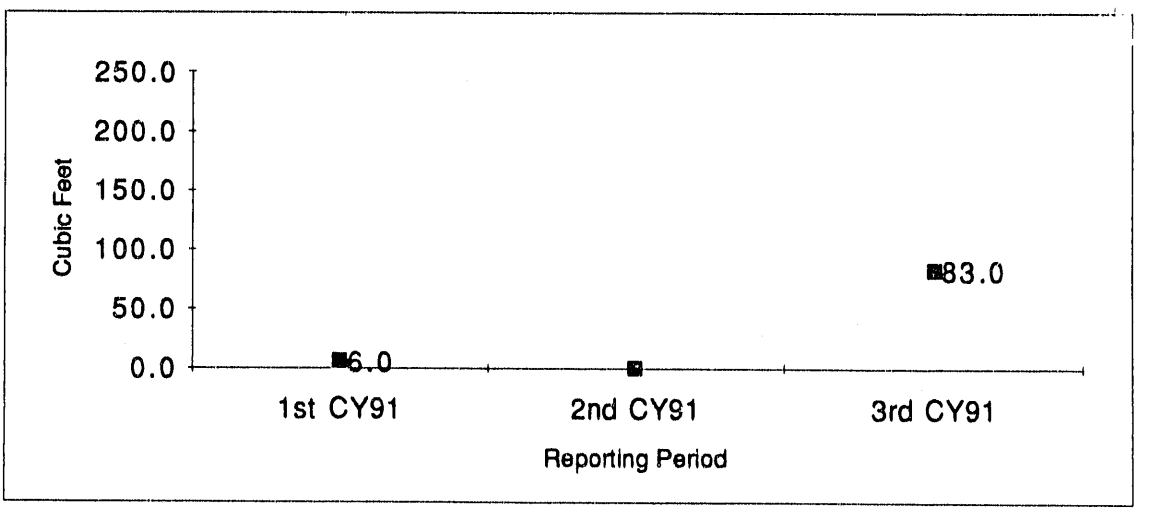
The total volume, in cubic feet, of the final form (pending shipment) of hazardous waste generated during the reporting period.



Pending shipments are slightly up over the last quarter.

4.7.2.3 Solid Low Level Hazardous Waste - Shipped

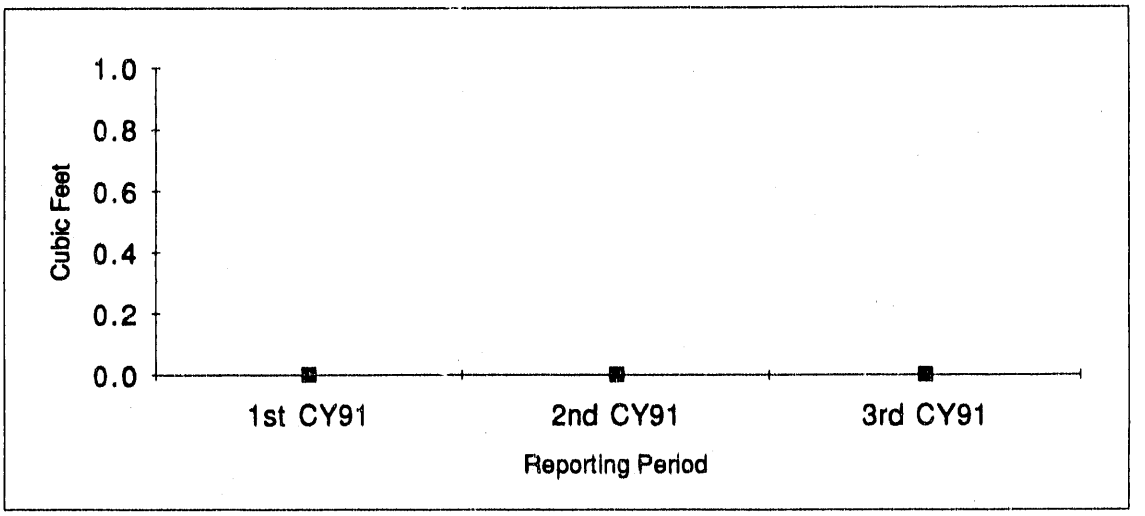
The total volume, in cubic feet, of hazardous waste shipped during the reporting period.



Shipments of hazardous waste were resumed during the third quarter of CY-1991.

4.7.3.1 Solid Low Level Mixed Waste - Generated

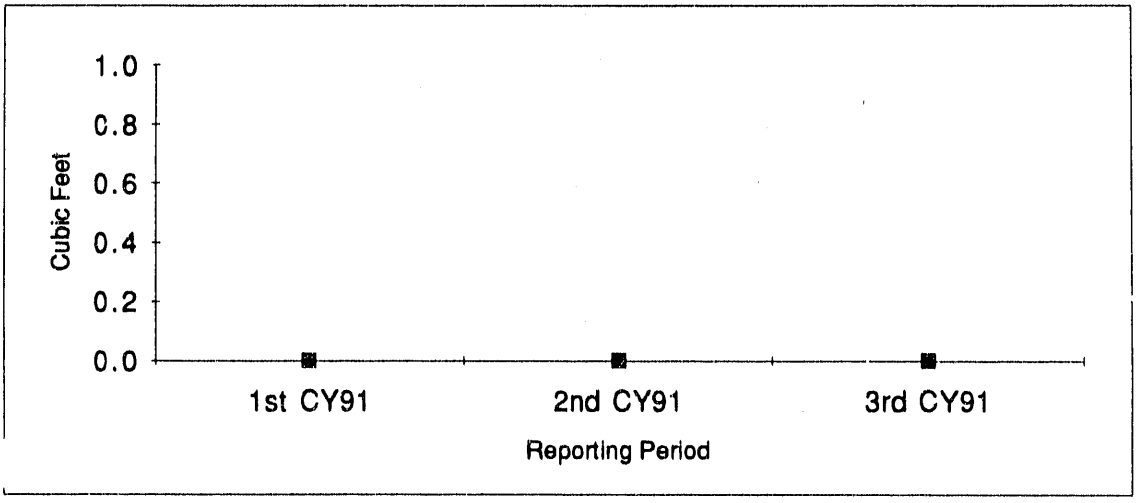
The total volume, in cubic feet, of mixed waste generated during the reporting period.



There has been no mixed waste generated to date for CY-1991.

4.7.3.2 Solid Low Level Mixed Waste - Ready to Ship

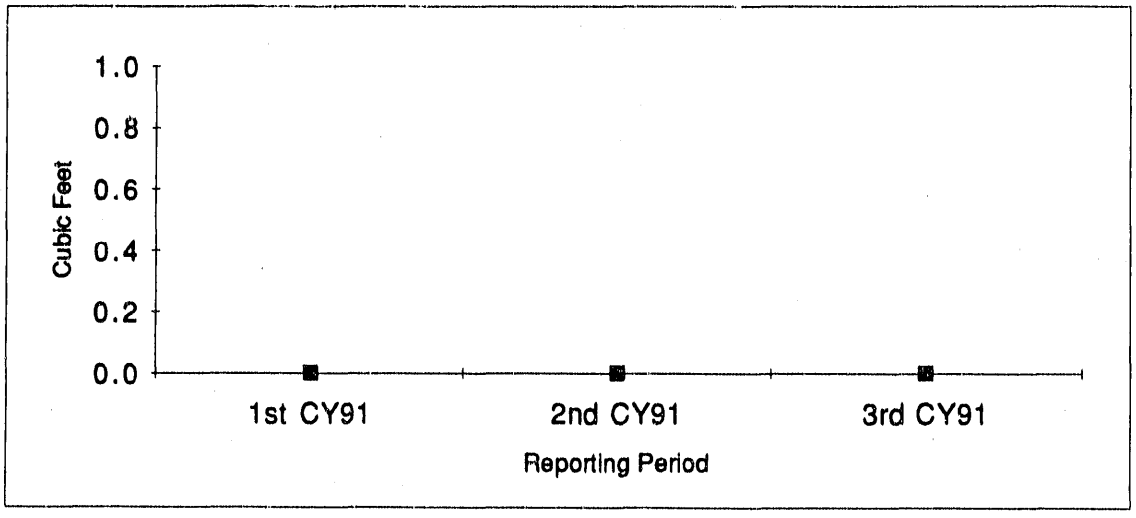
The total volume, in cubic feet, of the final form (pending shipment) of mixed waste generated during the reporting period.



There has been no mixed waste generated (hence, prepared to ship) for the calendar year.

4.7.3.3 Solid Low Level Mixed Waste - Shipped

The total volume, in cubic feet, of mixed waste shipped during the reporting period.



There has been no mixed waste generated (hence, shipped) to date for CY-1991.

APPENDIX 1: Summary By Performance Indicator

The following summary is based on an evaluation of the performance indicators for the third quarter of CY-1991. Due to the limited nature of the data, further conclusions concerning DOE performance in the areas of interest should be reserved until additional information is provided by the organizations responsible for the work. A more definitive depiction of performance will become available in future reports as historical performance indicator data are accumulated to establish performance trends.

1.0 Personnel Safety

1.1 Collective Radiation Dose

Collective radiation dose remains well within permitted levels.

1.2 Skin Contaminations

Zero contaminations for the three documented periods.

1.3 Internal Contaminations

No confirmed intakes of radioactive material for facility personnel.

1.4 Radioactive or Hazardous Material Overexposures

No radioactive or hazardous material overexposures for the three quarters recorded.

1.5 Lost Work Day Cases (Lost Time Accident Rate)

Lost work day incidents are at a three quarter high for CY-1991, but the year-to-date rate is still acceptable.

1.6 Recordable Injuries and Illnesses Rate

Recordable injury and/or illness incidents are at a three quarter high, but the year-to-date rate for the calendar year is still acceptable.

2.0 Operational Incidents

2.1 Environmental Incidents

None in the current reporting period. Two to date for CY-1991.

2.2 Unplanned Safety Function Actuations

None to date during the calendar year.

2.3 Violations of Operating Procedures

None in the current reporting period. Two to date for CY-1991.

2.4 OSHA Violations

The number of OSHA violations is much lower than in the first quarter of CY-1991, but it is still greater than desired.

2.5 Unplanned Shutdowns

None to date for CY-1991.

2.6 Emergencies and Unusual Occurrences

None in the current reporting period. Three to date.

3.0 Environmental Releases (Normal Operations)

3.1 Radionuclide Effluent Releases

3.1.1 Airborne:

The airborne radionuclide effluent releases have been negligible to date.

3.1.2 Liquid:

None to date during CY-1991.

3.2 Hazardous Substance/Regulated Pollutant Effluent Releases

3.2.1 Airborne:

Not determined. LBL has no measuring system/device to determine the requested data.

3.2.2 Liquid:

The liquid hazardous substance/regulated pollutant effluent releases have been below regulatory limits to date this year.

4.0 Management

4.1 Open DOE Audit Issues

Not reported to date. Awaiting DOE guidance.

4.2 Open External Organization Recommendations

Not reported to date. Awaiting DOE guidance.

4.3 Occurrence Reports with Open Corrective Actions

Remains moderate at seven for the current reporting period.

4.4 Corrective Maintenance Backlog

Down to 11.9% in the current reporting period from 34.0% in the second quarter.

4.5 Preventive Maintenance Overdue

Up to 6.2% in the current reporting period from 3.5% in the second quarter.

4.6 Substance Abuse Incidents

None to date for CY-1991.

4.7 Volume of Solid Waste Generated

4.7.1 Low-Level Radioactive Waste

There has been no low-level radioactive waste generated during the current year.

4.7.2 Low-Level Hazardous Waste

4.7.2.1 Generated

The amount of low-level mixed generated is the largest to date for CY-1991, 244.8 cubic feet. The amount generated has been increasing steadily over the last three quarters.

4.7.2.2 Pending Shipment

The amount of low-level mixed waste pending shipment has increased slightly since the last quarter.

4.7.2.3 Shipped

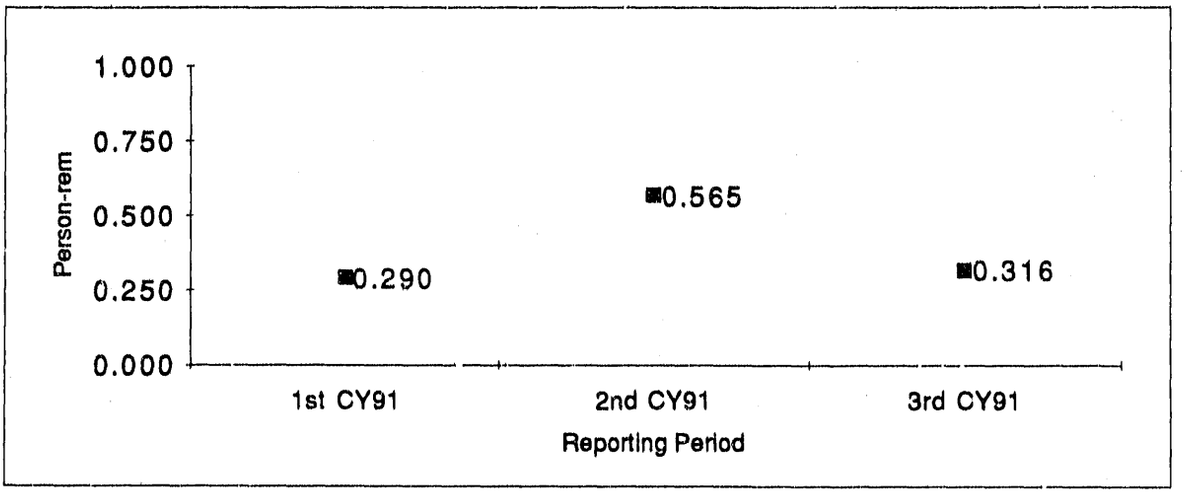
The shipment of low-level mixed waste has resumed in the third quarter.

4.7.3 Low-Level Mixed Waste

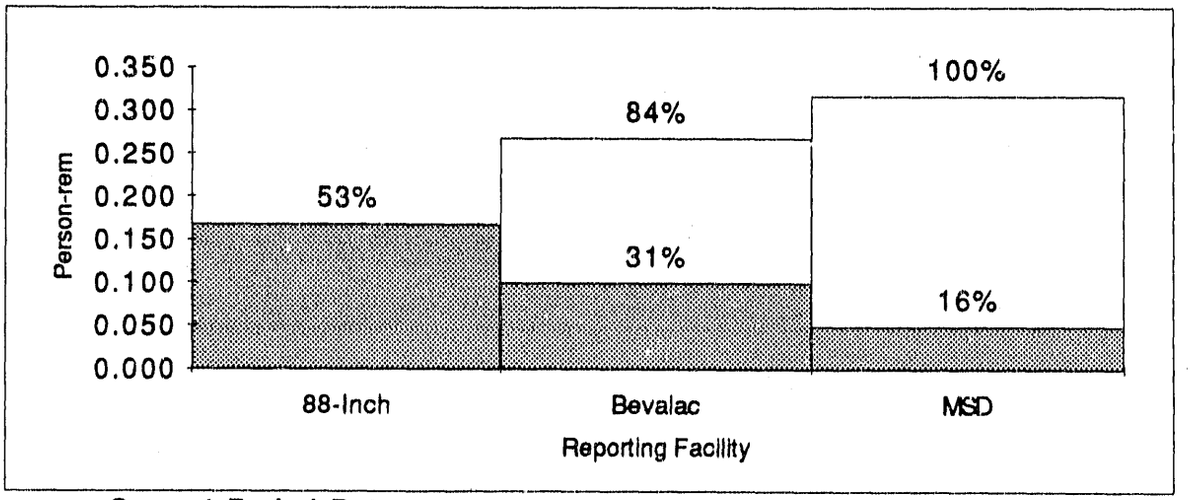
There has been no low-level mixed waste generated during the current calendar year.

1.1 Collective Radiation Dose

The total external whole-body dose (deep and shallow) received by all facility personnel (including subcontractors and visitors) as measured by the primary dosimeter, i.e., thermoluminescent dosimeter (TLD), or film badge. Exposure measured by direct reading dosimeters should be included only for those periods or situations when more accurate data are not available. Collective radiation dose is reported in units of person-rem.

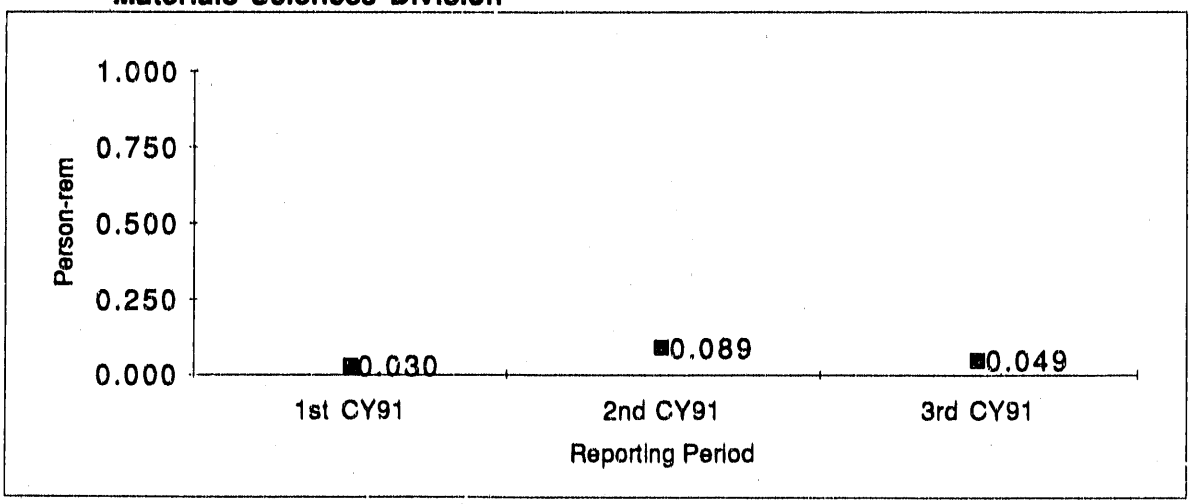


All three reporting quarters have had collective radiation doses well below permitted levels.



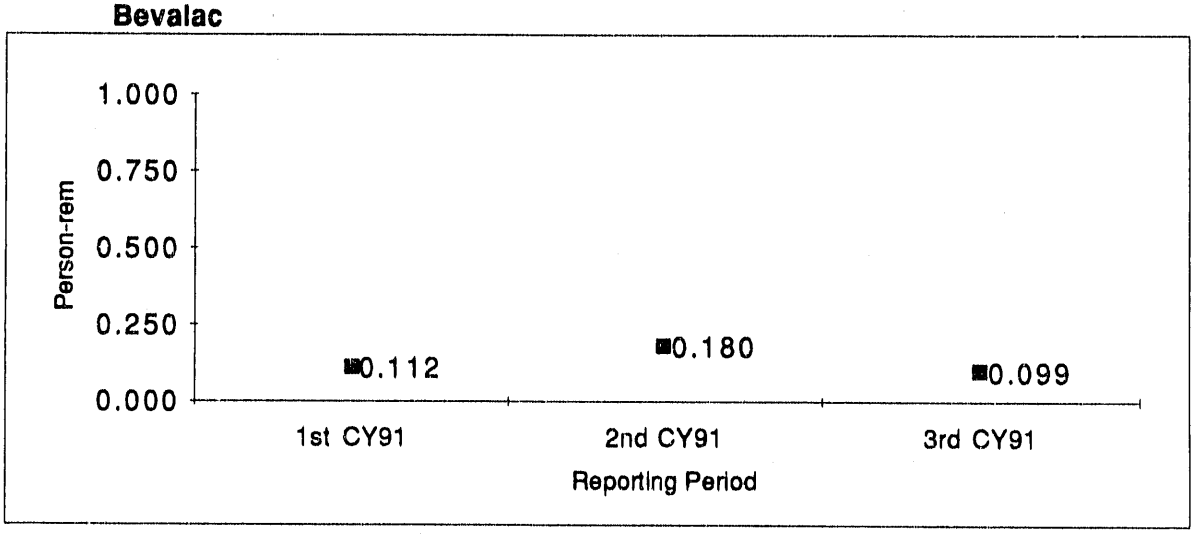
Current Period Data

Materials Sciences Division



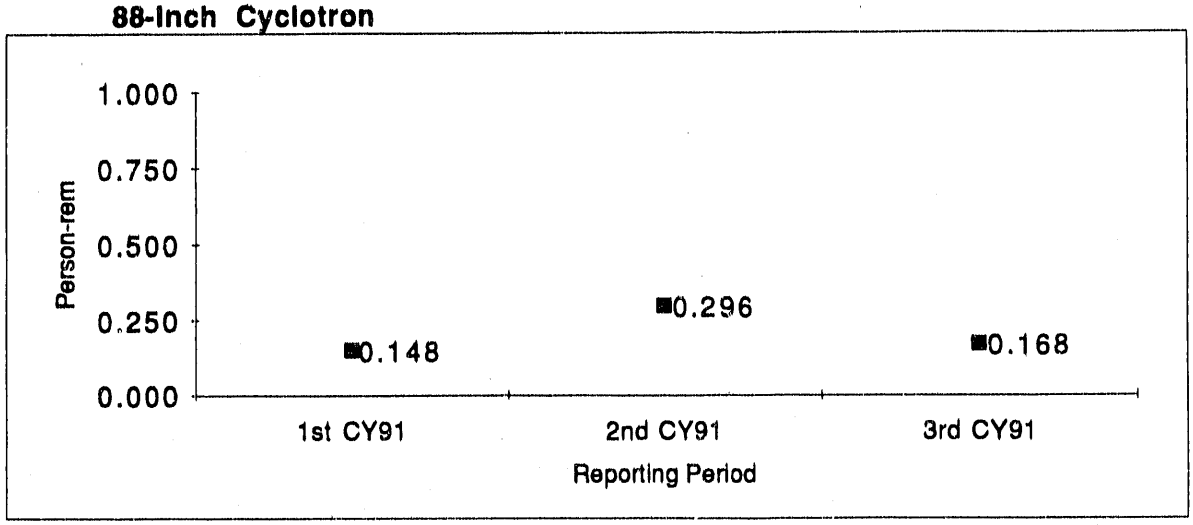
Well below permitted levels.

Bevalac



Well below permitted levels.

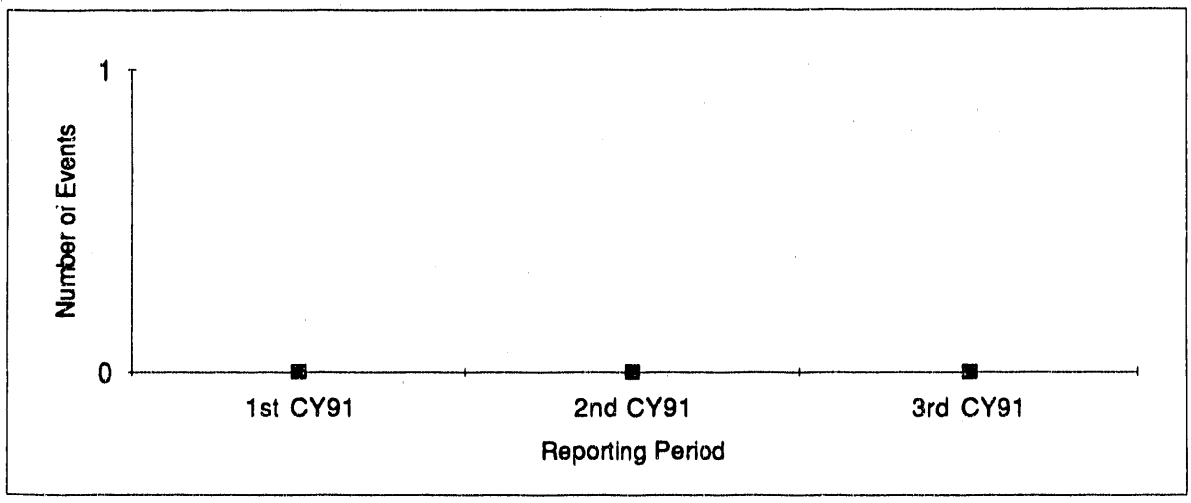
88-Inch Cyclotron



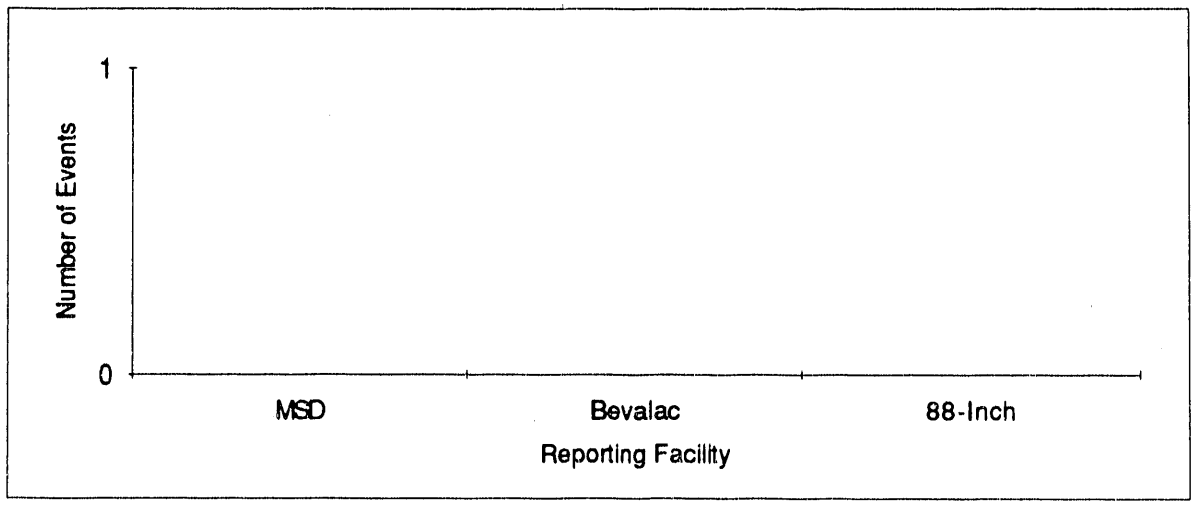
Well below permitted levels.

1.2 Skin Contaminations

The total number of confirmed skin and personal clothing contaminations for all facility personnel, including subcontractors and visitors. Skin or clothing contamination due to radioactive noble gases or naturally occurring radon gas are not included.



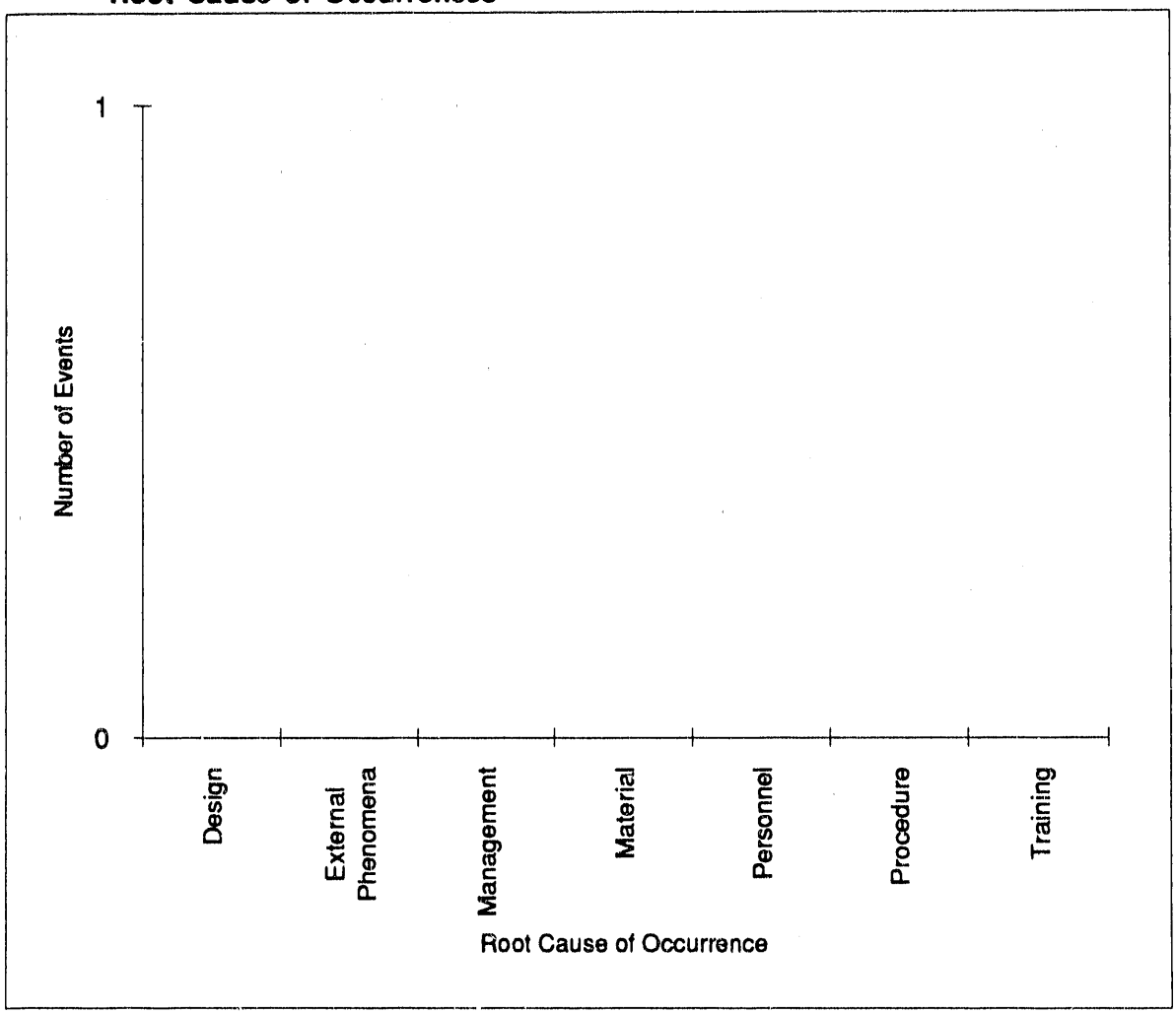
There has not been an incident of skin contamination at LBL in the past three quarters.



Current Period Data

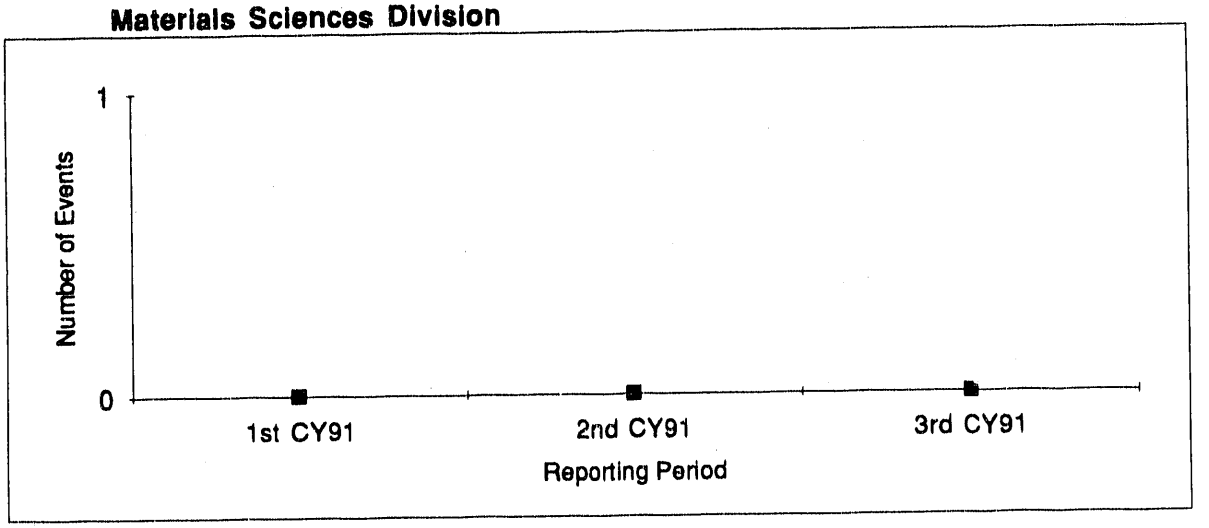
No incidents of skin contamination.

Root Cause of Occurrences



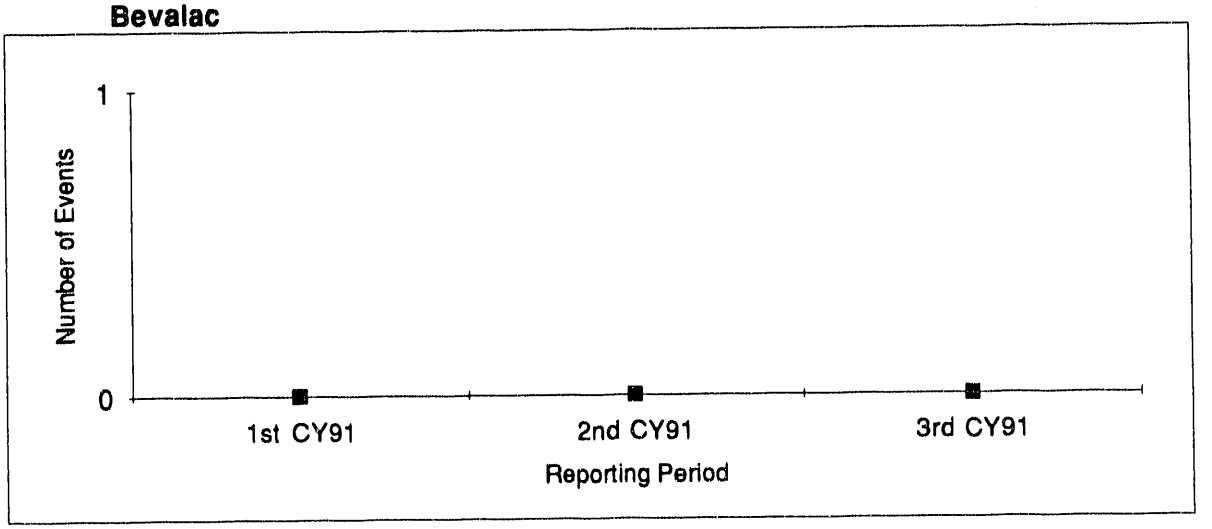
There has not been an incident of skin contamination at LBL in the past three quarters.

Materials Sciences Division

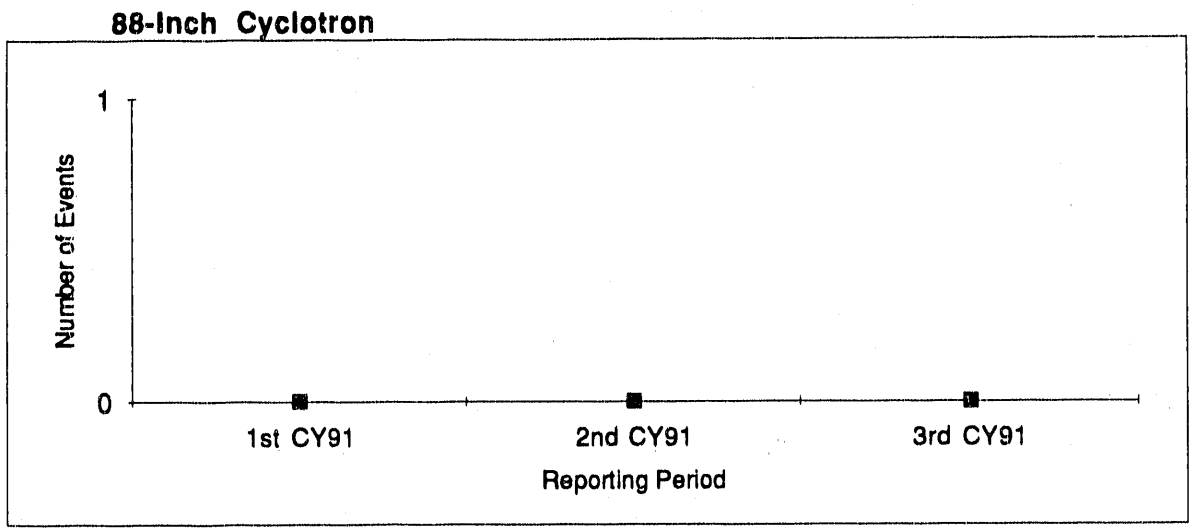


No incidents of skin contamination.

Bevalac



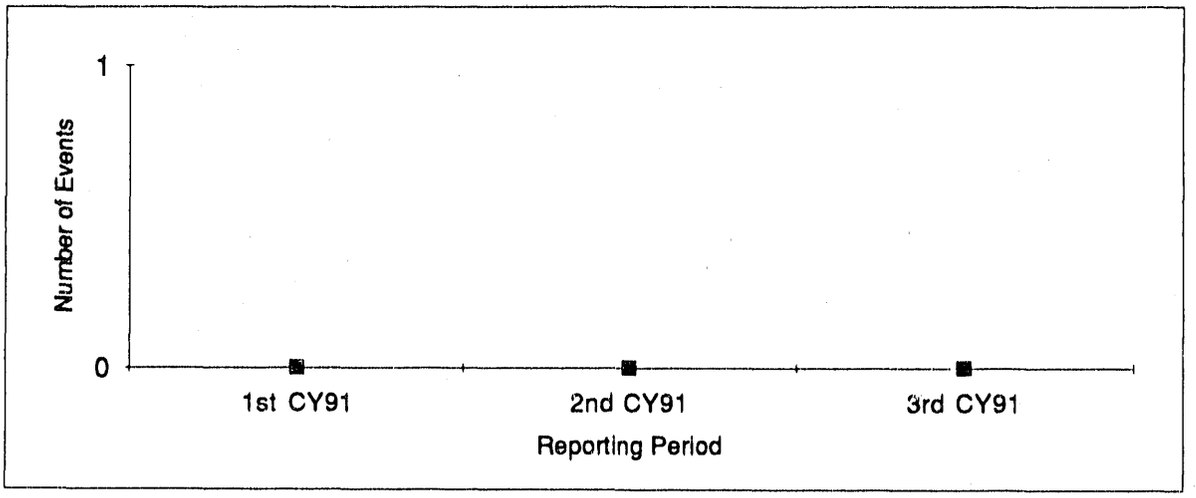
No incidents of skin contamination.



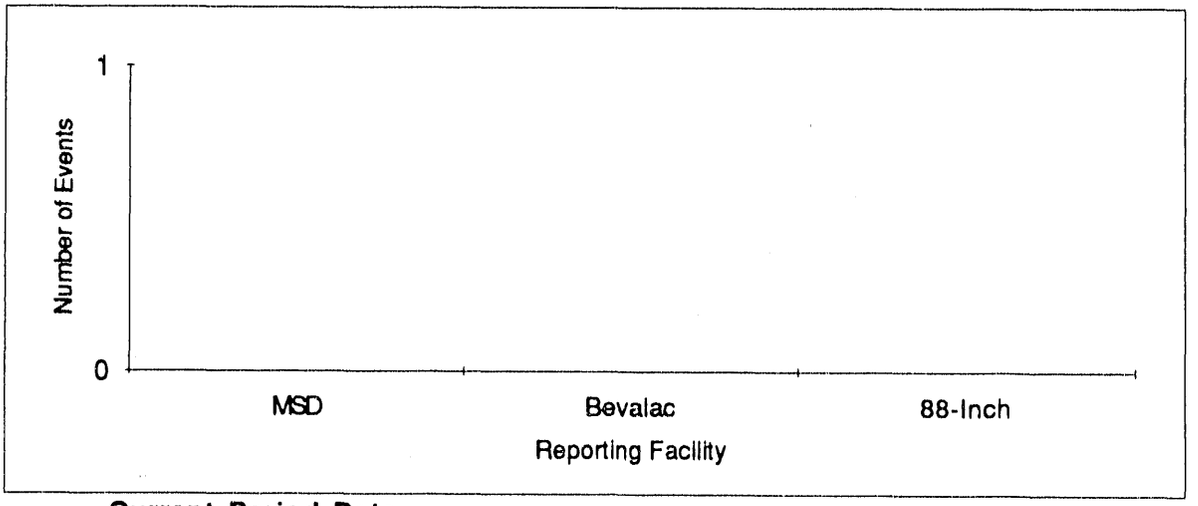
No incidents of skin contamination.

1.3 Internal Contaminations

The total number of confirmed intakes of radioactive material for all facility personnel, including subcontractors and visitors, occuring during the reporting period.



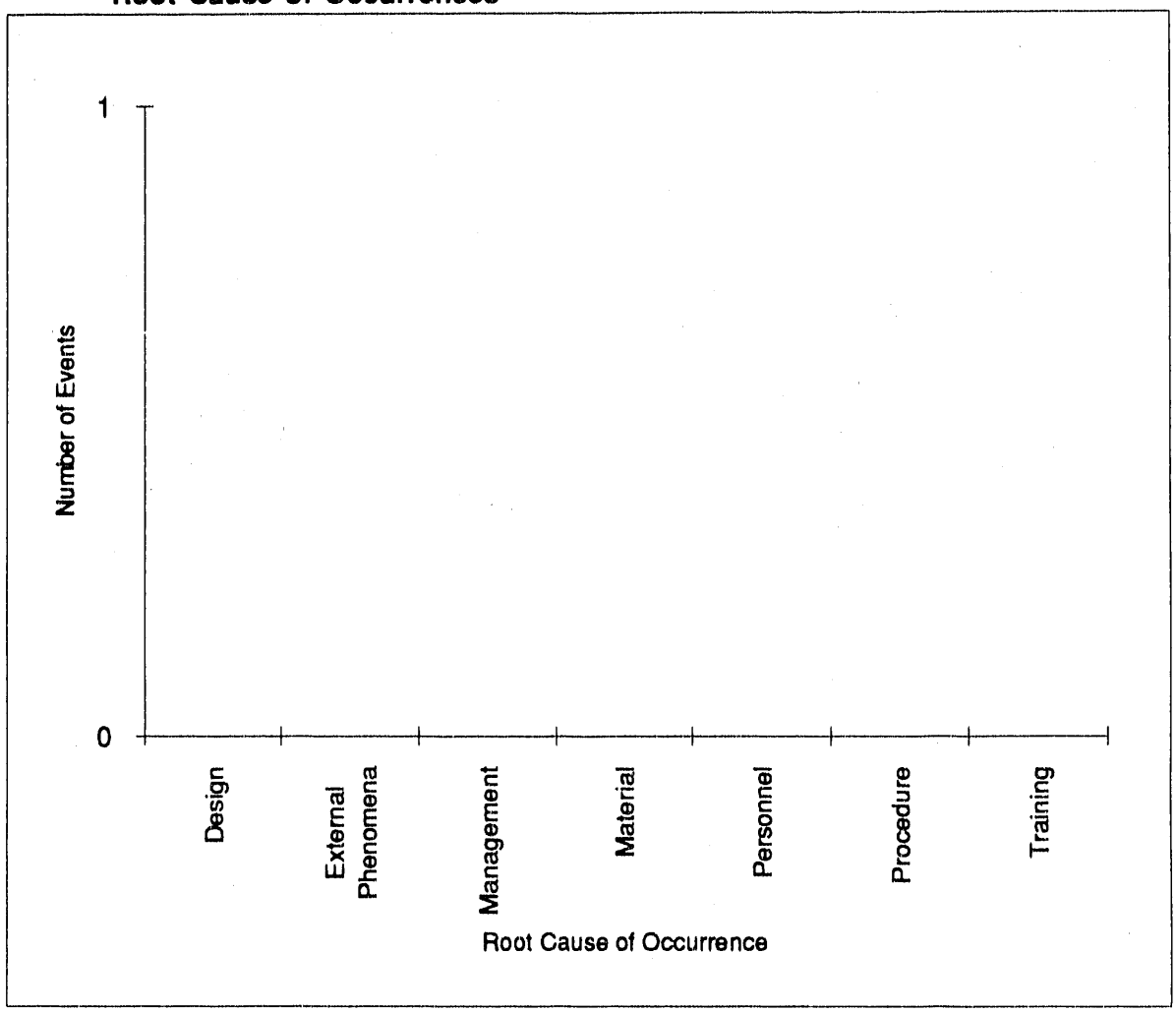
There has not been an incident of internal contamination at LBL in the past three quarters.



Current Period Data

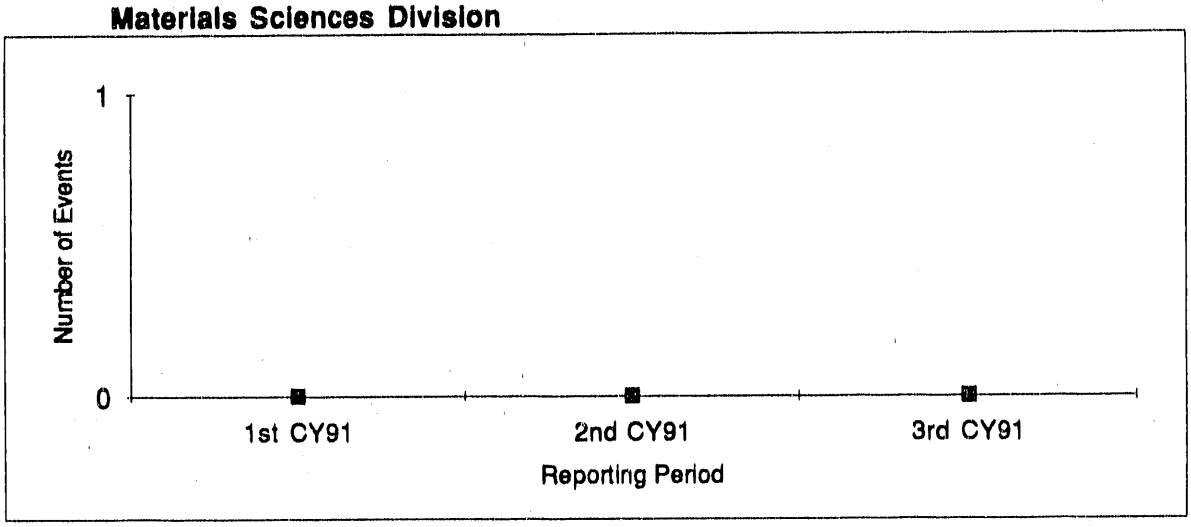
No incidents of internal contamination.

Root Cause of Occurrences



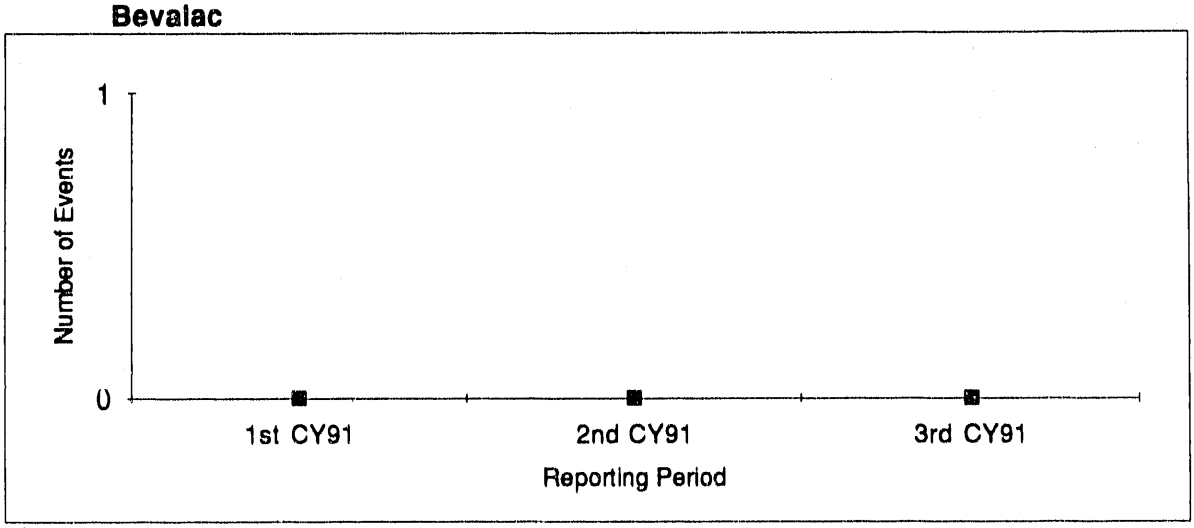
There has not been an incident of internal contamination at LBL in the three quarters of calendar year 1991.

Materials Sciences Division



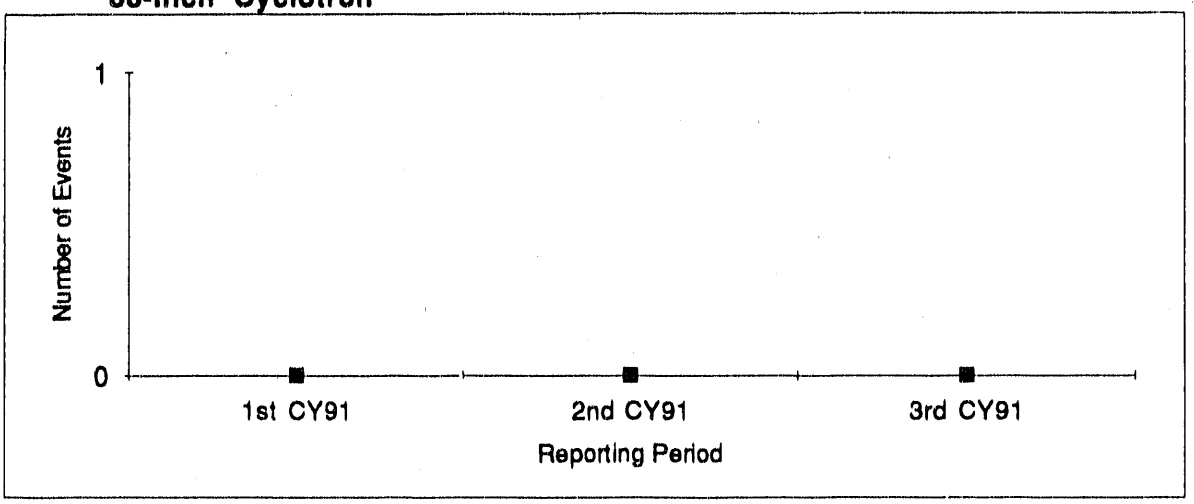
No incidents of internal contamination.

Bevalac



No incidents of internal contamination.

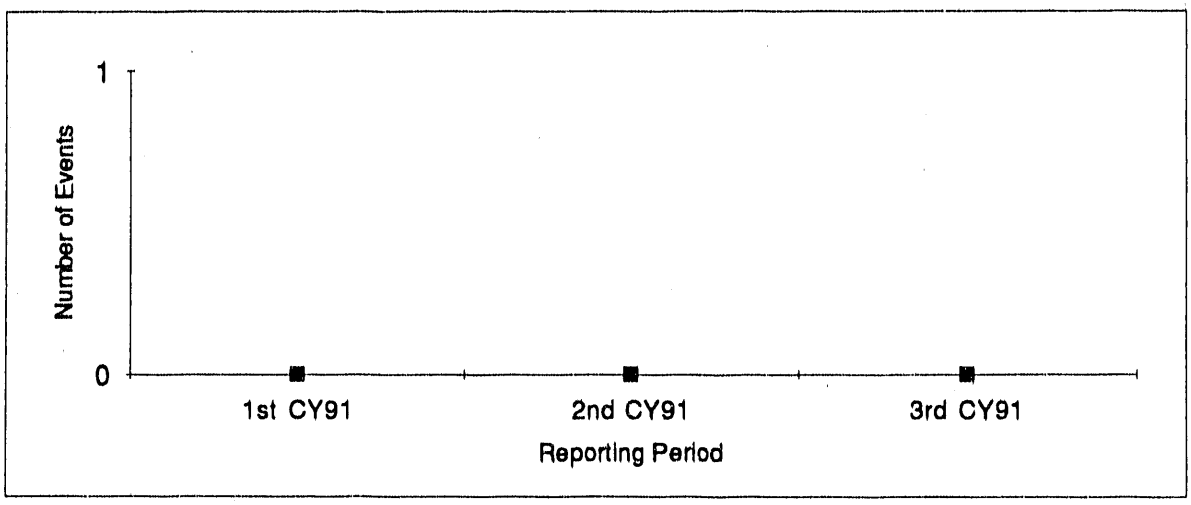
88-Inch Cyclotron



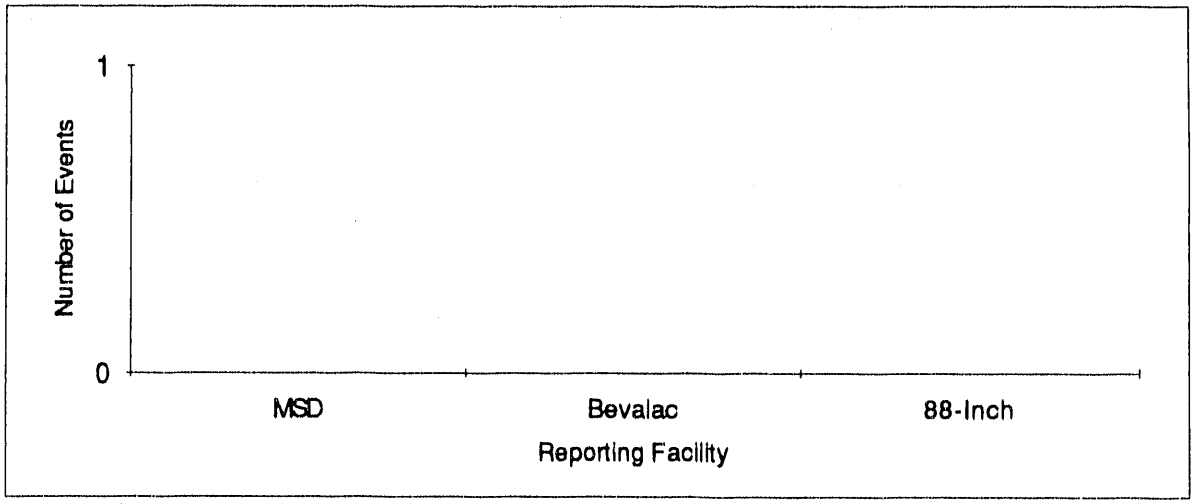
No incidents of internal contamination.

1.4 Radioactive or Hazardous Material Overexposures

The number of reportable occurrences resulting from a personnel exposure (for all facility personnel, including subcontractors and visitors) to radioactive or hazardous materials in excess of limits established in DOE Orders.



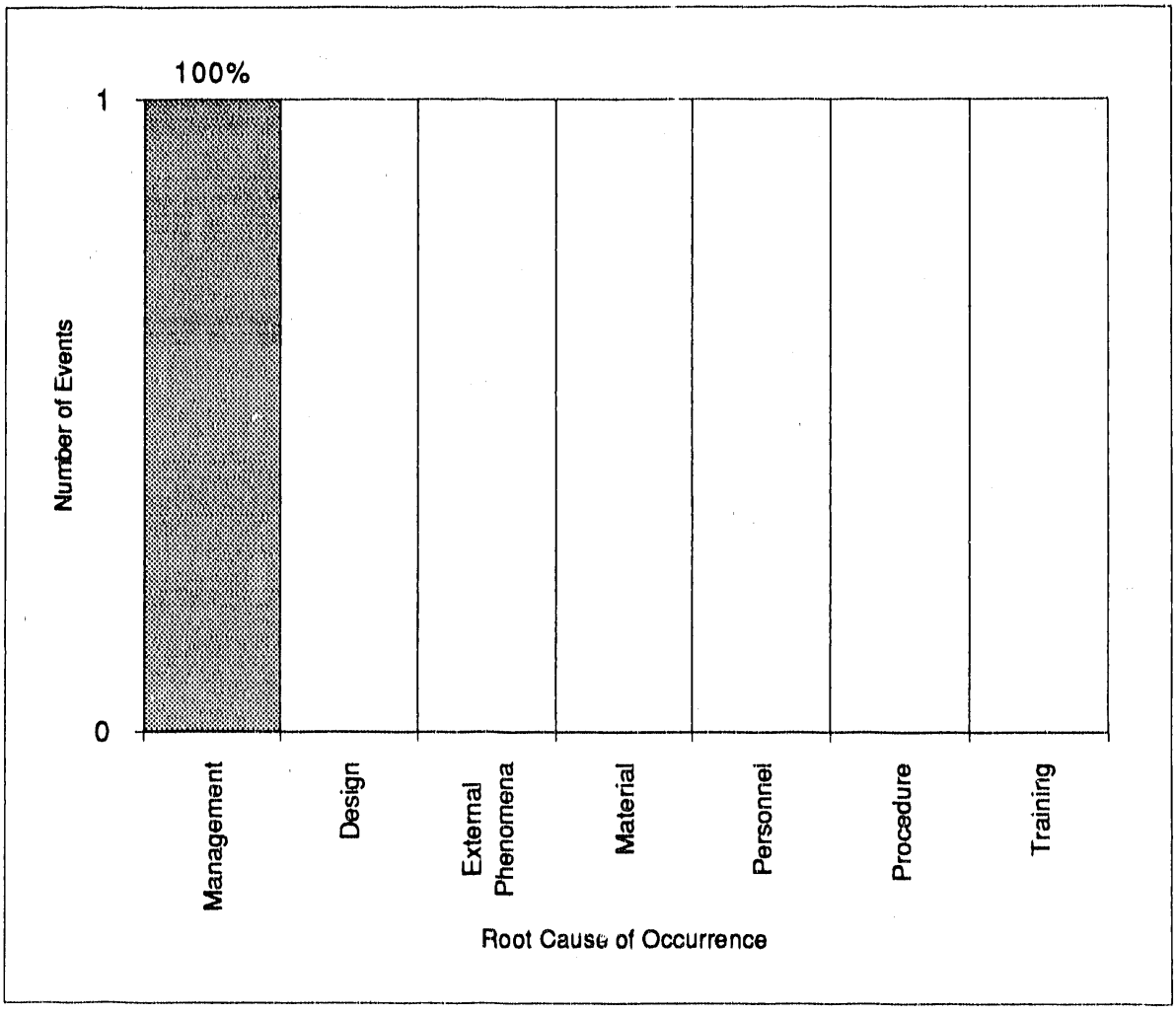
There have been no incidents of overexposure to radioactive or hazardous materials at LBL in the past three quarters. (The incident reported for the second quarter in the previous report occurred in 1990).



Current Period Data

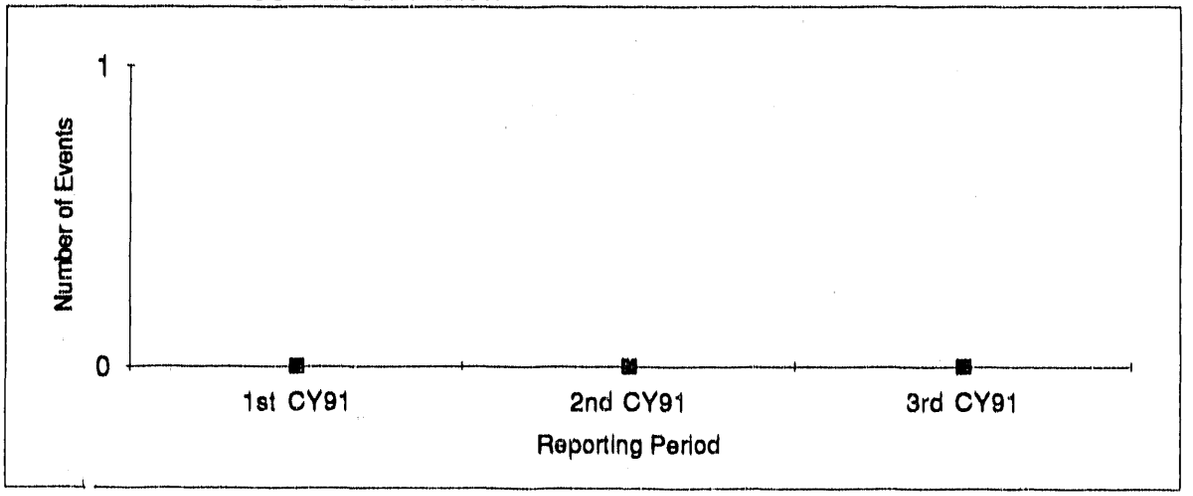
No incidents of overexposure to either radioactive or hazardous materials.

Root Cause of Occurrences



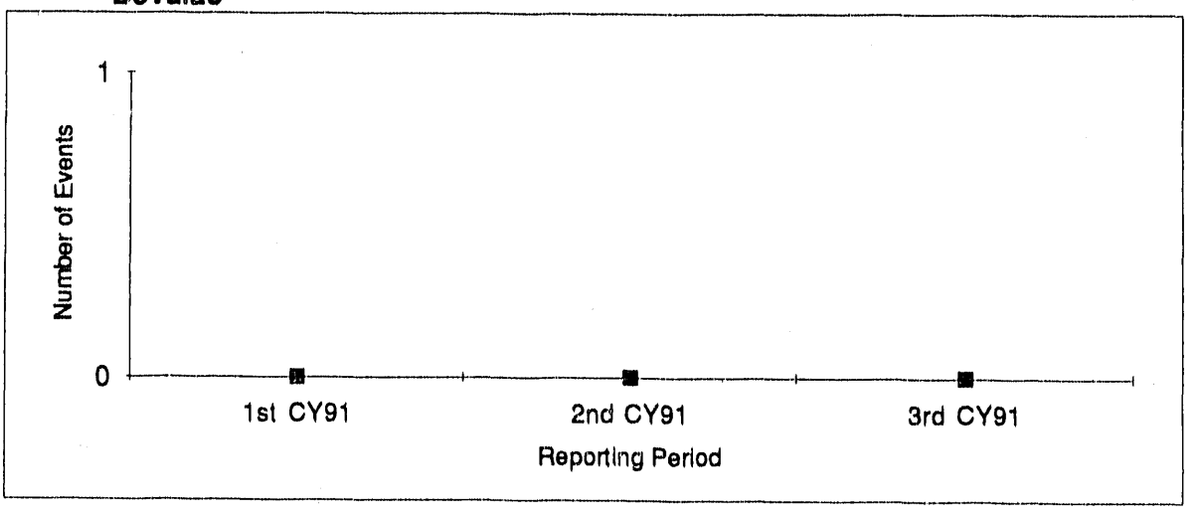
Although there have been no overexposures to radioactive or hazardous materials at LBL in the PI reporting quarters (1st - 3rd qtrs, CY-1991), there was an overexposure (LBL-90-28-51-8) in 1990 which had *Management* as it root cause.

Materials Sciences Division

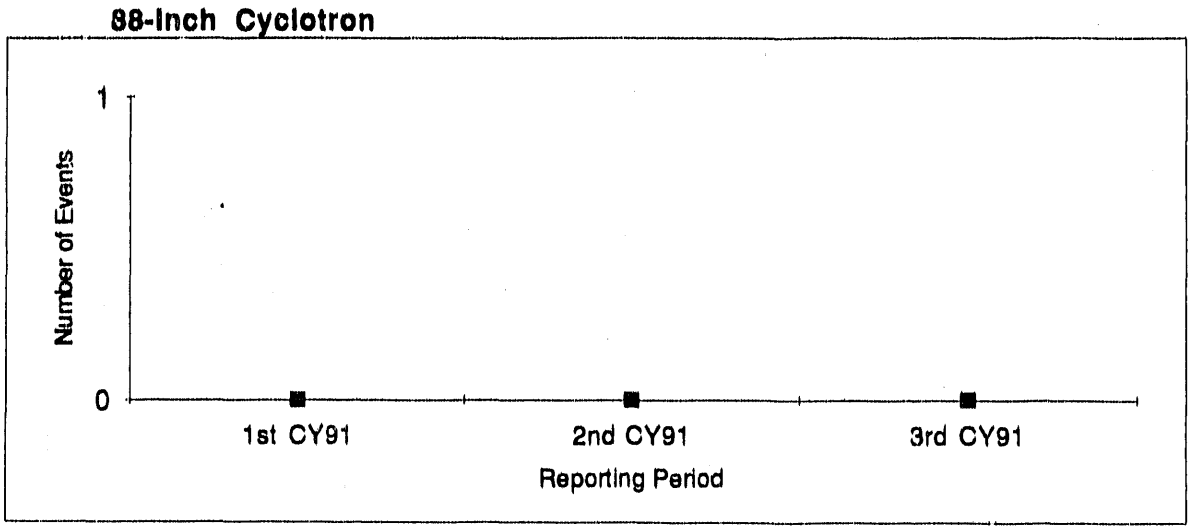


No incidents of overexposure to either radioactive or hazardous materials.

Bevalac



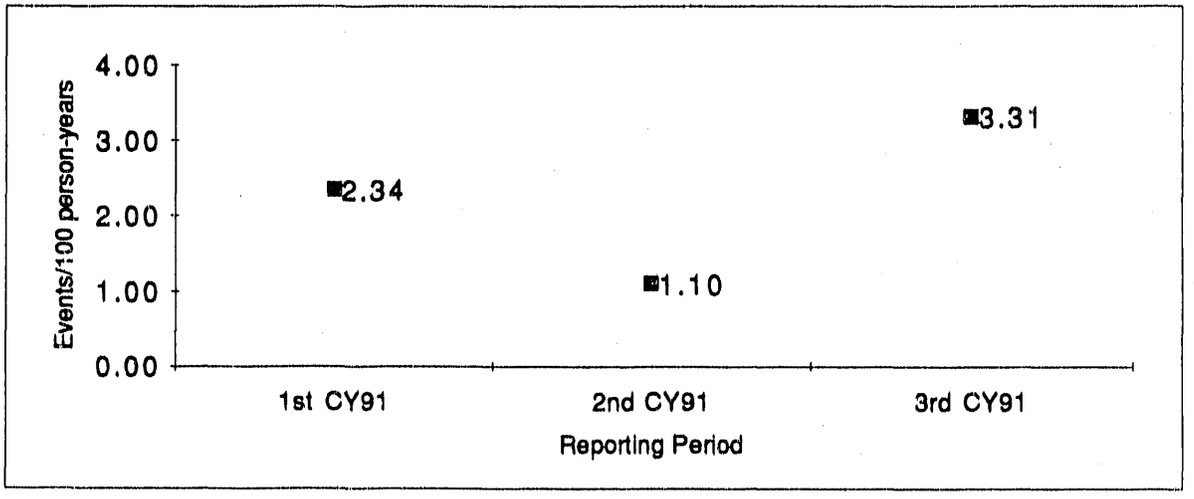
Although one second quarter overexposure was reported in the previous report, this incident took place, in fact, in 1990 and should not have been included. To date, there have been no incidents of overexposure to either radioactive or hazardous materials at the Bevalac facility for the reporting periods.



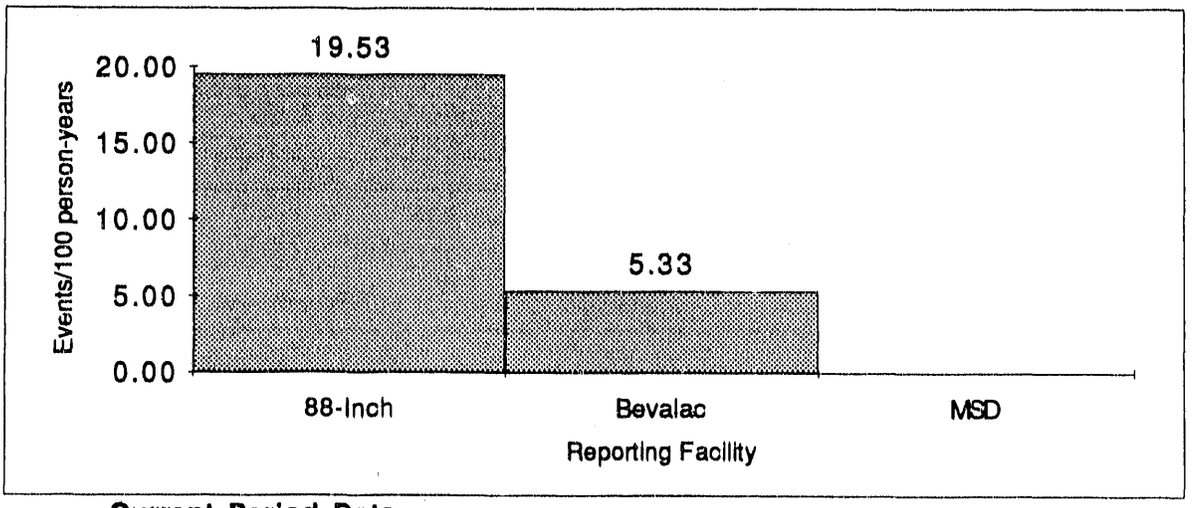
No incidents of overexposure to either radioactive or hazardous materials.

1.5 Lost Work Day Cases (Lost Time Accident Rate)

Number of incidents for all facility personnel involving days away from work per 100 person-years (200,000 person-hours) worked.



Because there has not been a large deviation in the number of hours worked at the three LBL facilities, the trend for rates also reflects the trend for number of lost work day cases for the first three quarters of 1991 (2, 1, and 3, respectively, per quarter.)

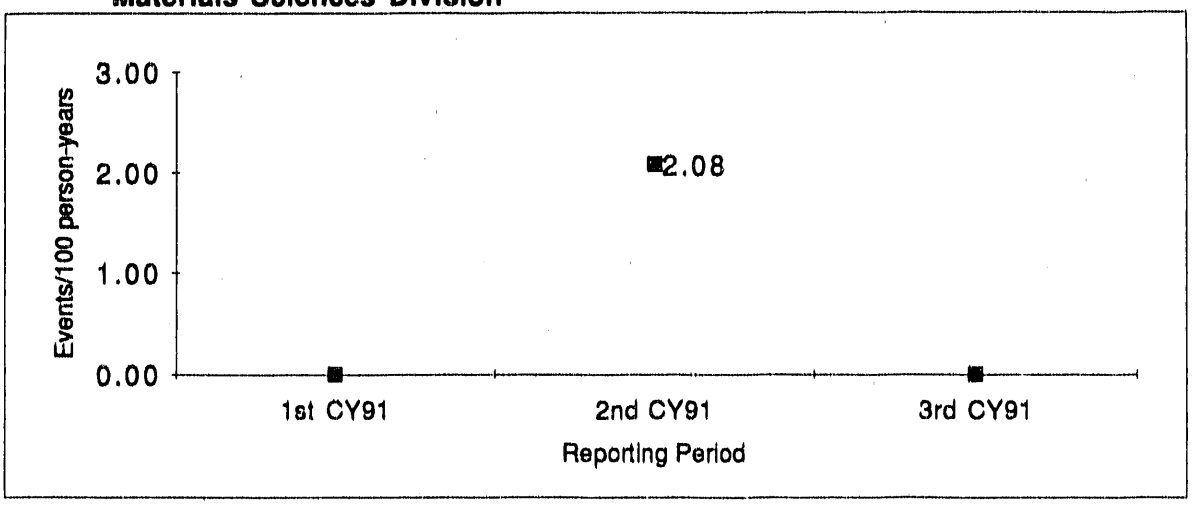


Current Period Data

Note: Because the sum of the facility rates does not accurately reflect the overall LBL rate, the individual facility rates are given here.

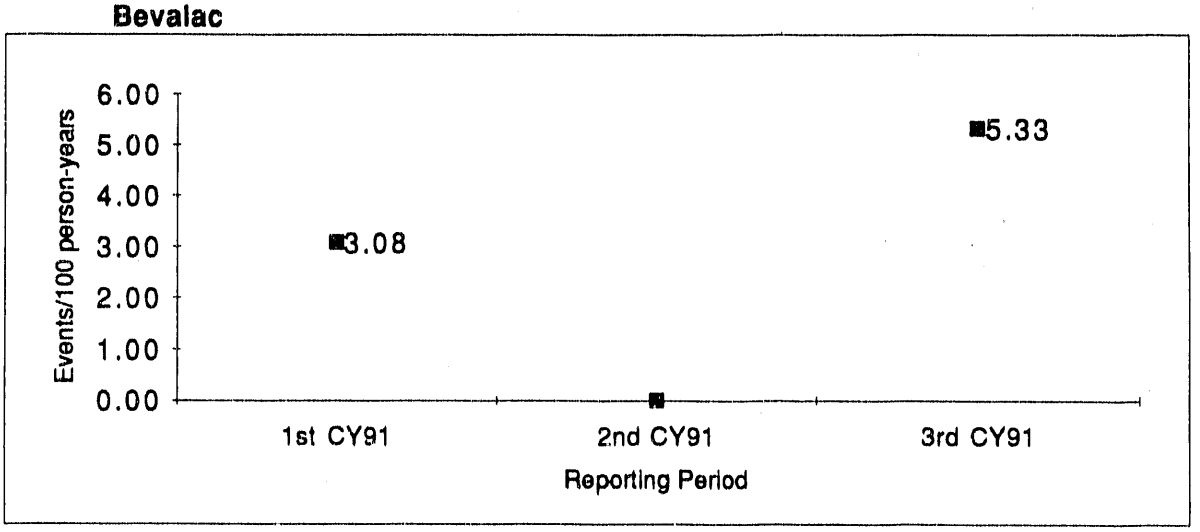
The seemingly large rate for the 88-Inch facility is due in part to the low number of personnel at the facility (approx. 22). There was, in fact, only one (1) event at the 88-Inch facility in the third quarter.

Materials Sciences Division



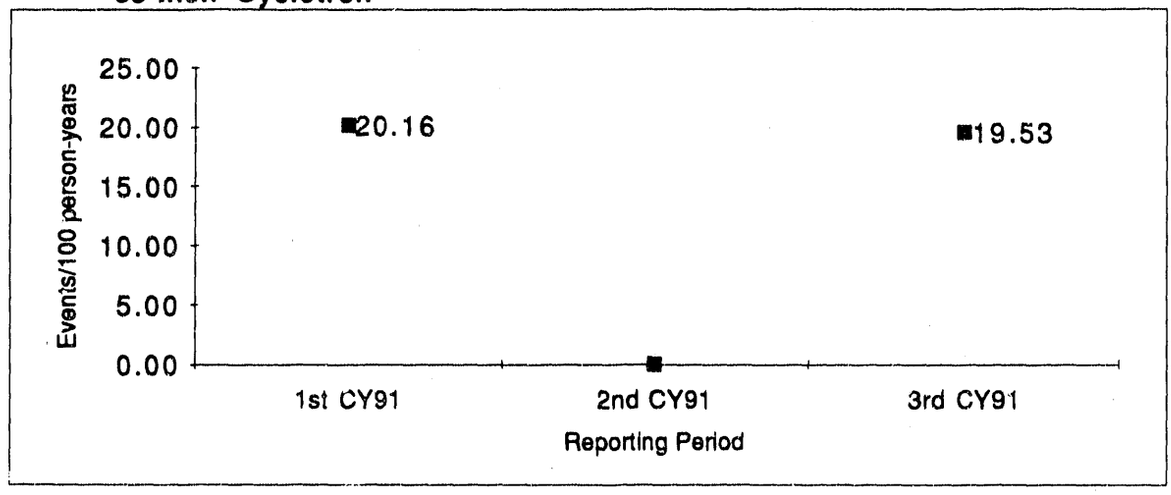
The above rates reflect one (1) incident in the second quarter, and none in either the first or third. The Materials Sciences Division has approximately 200 personnel.

Bevalac



The above rates reflect one (1) incident in the first quarter, none in the second, and two (2) in the third. The Bevalac facility has approximately 150 personnel.

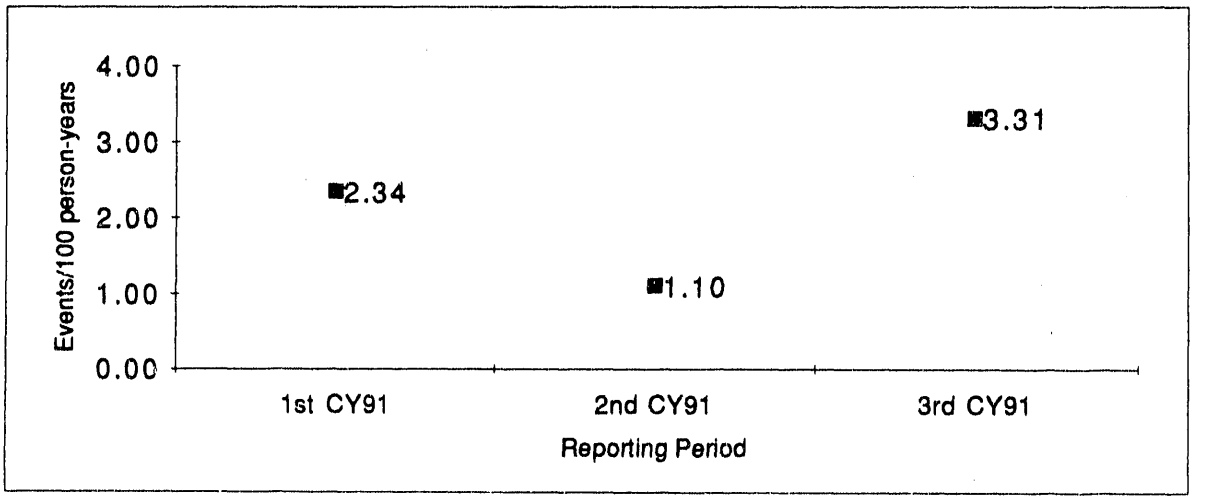
88-Inch Cyclotron



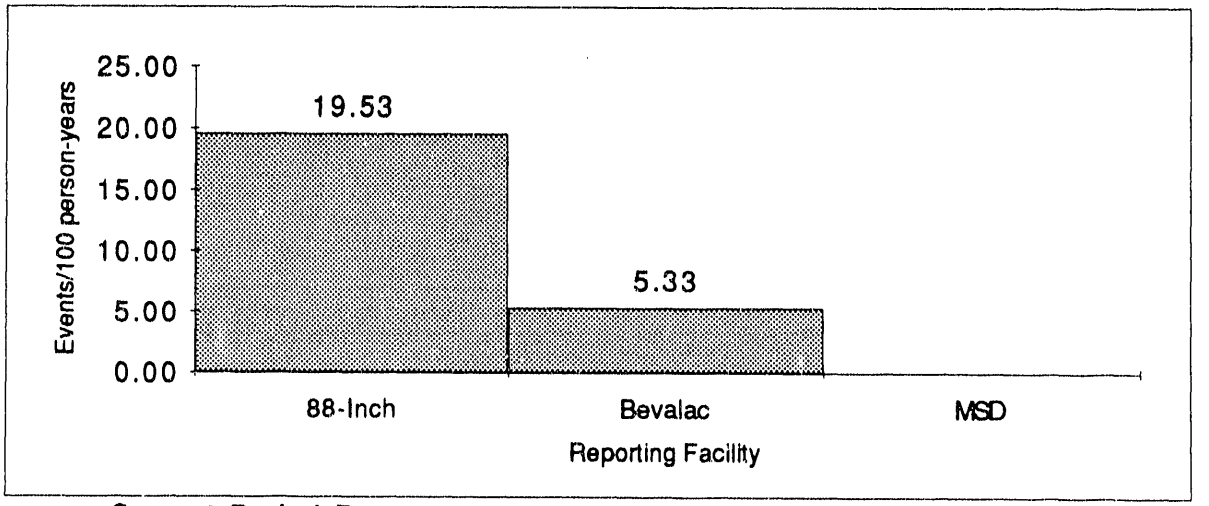
The above rates reflect one (1) incident in both the first and third quarters, and none in the second. The associated high rates are due partially to the low employee population at the 88-Inch facility (approximately 22).

1.6 Recordable Injuries/Illnesses Rate

Total number of injuries or illness instances resulting from on-the-job activities that are recordable in accordance with OSHA Standards, per 100 person-years (200,000 person-hours) worked.



Because there has not been a large deviation in the number of hours worked at the three LBL facilities, the rate trend reflects the trend associated with the recordable injuries/illnesses for the first three quarters of 1991 (2, 1, and 3, respectively, per quarter.)

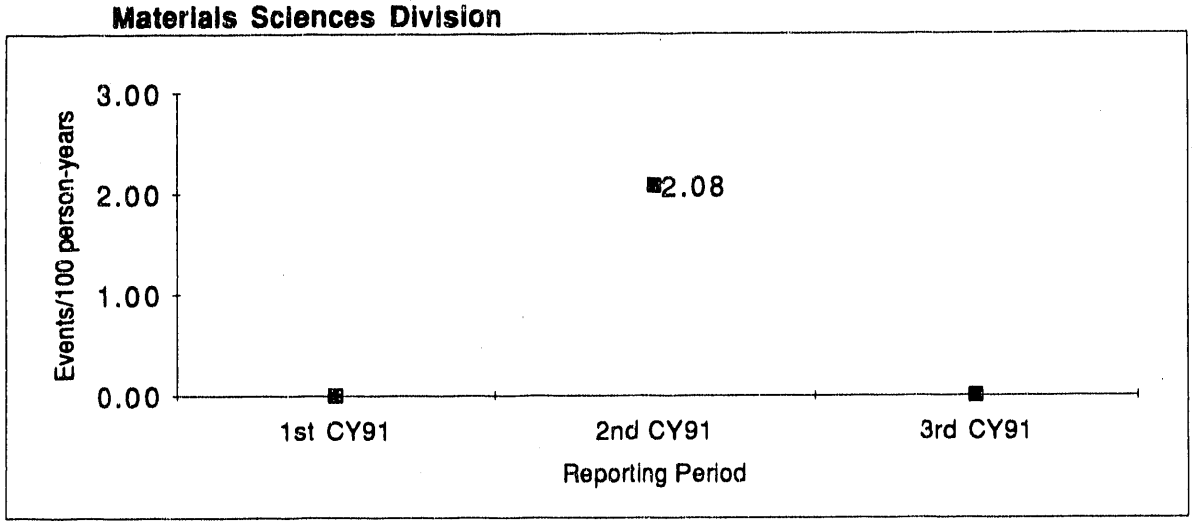


Current Period Data

Note: Because the sum of the facility rates does not accurately reflect the overall LBL rate, the individual facility rates are given here.

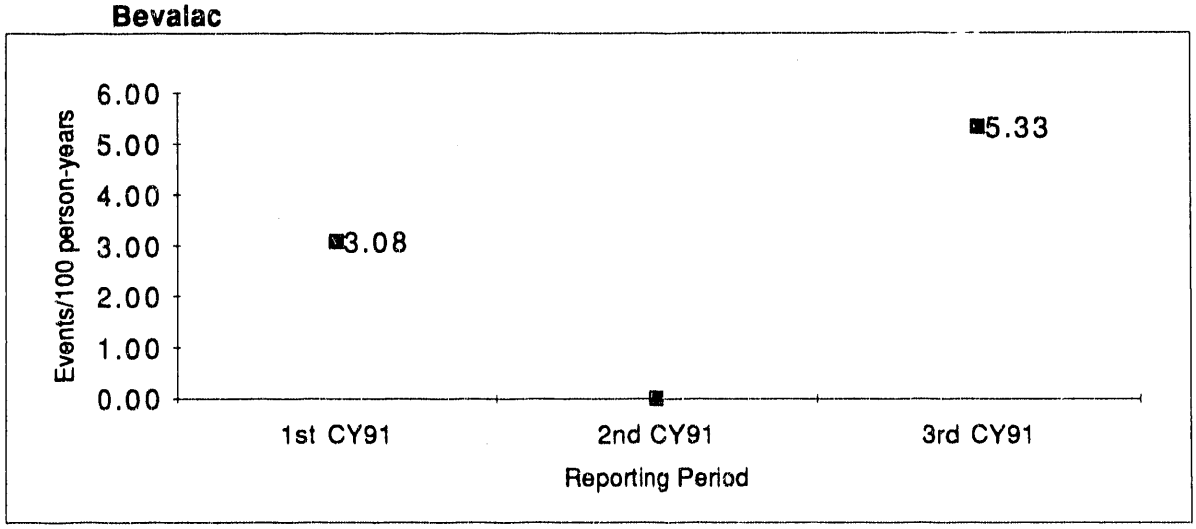
The seemingly large rate for the 88-Inch facility is due primarily to the low number of personnel at the facility (approx. 22).

Materials Sciences Division

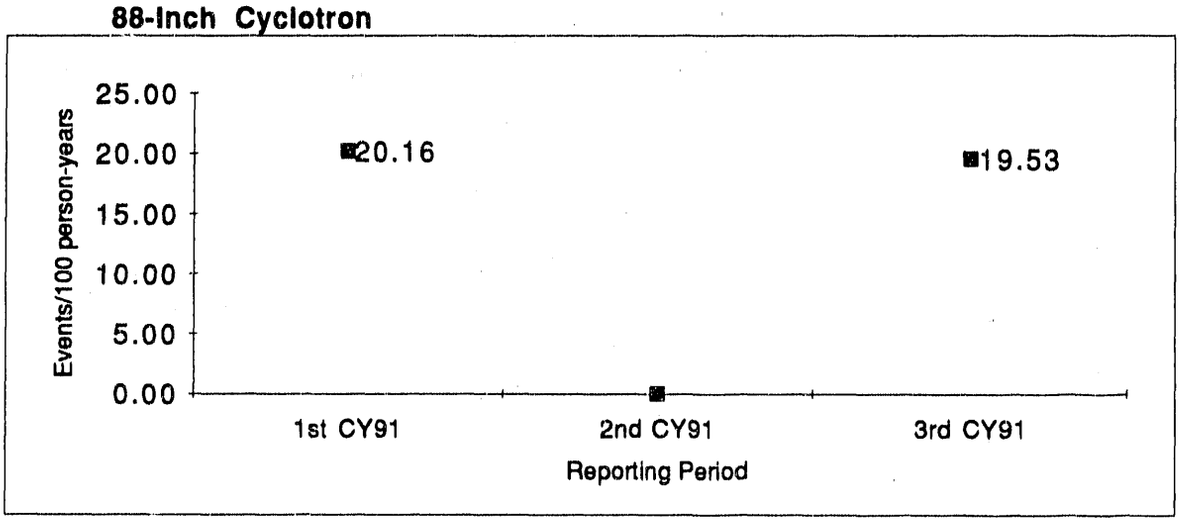


The above rates reflect one (1) incident in the second quarter, and none in either the first or third. The Materials Sciences Division has approximately 200 personnel.

Bevalac



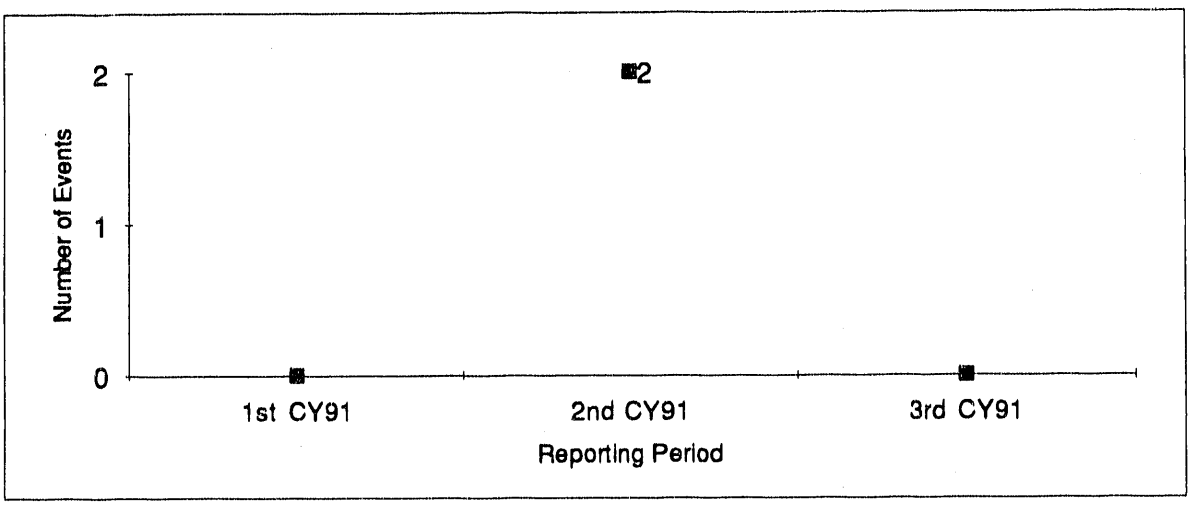
The above rates reflect one (1) incident in the first quarter, none in the second, and two (2) in the third. The Bevalac facility has approximately 150 personnel.



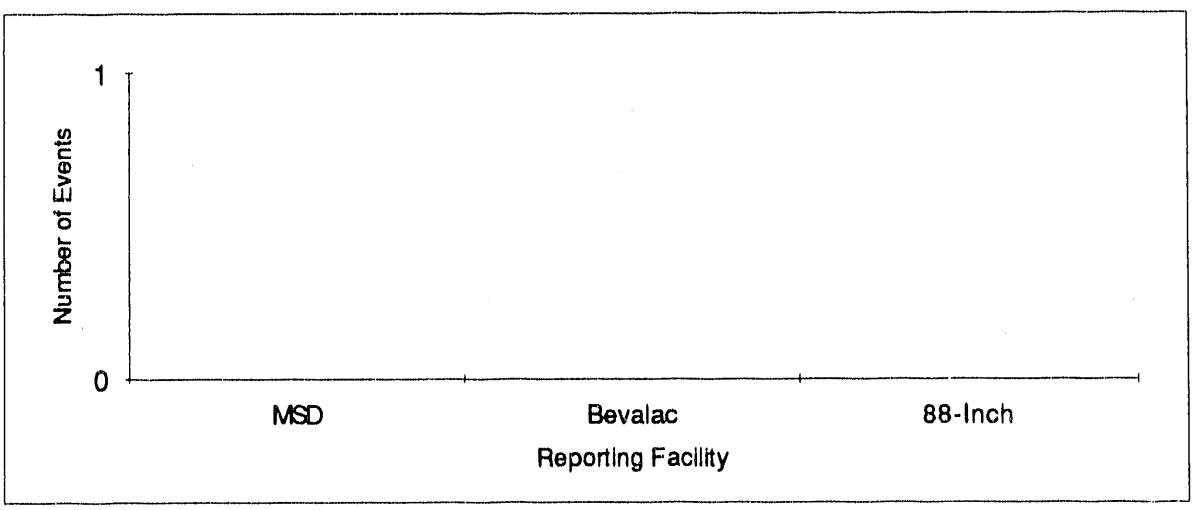
The above rates reflect one (1) incident in both the first and third quarters, and none in the second. The seemingly large magnitude of the rates is due to the low employee population at the 88-Inch facility (approximately 22).

2.1 Environmental Incidents

The number of reportable occurrences, both on-site and off-site, involving an inadvertent radioactive or hazardous material spill or release.



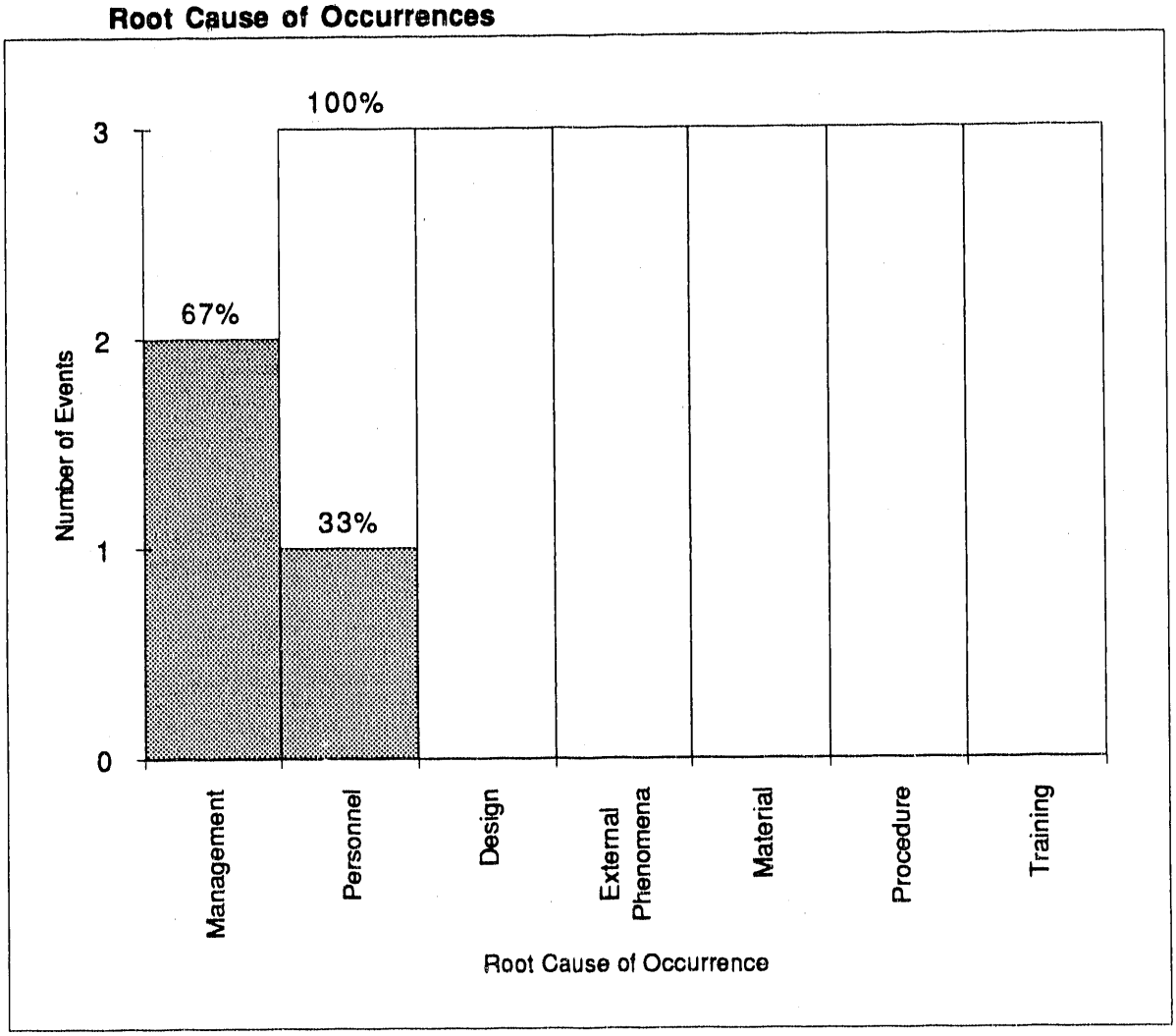
In the second quarter report, the number of environmental incidents was given as three. In fact, one of these incidents occoccurred in 1990 and should not have been included.



Current Period Data

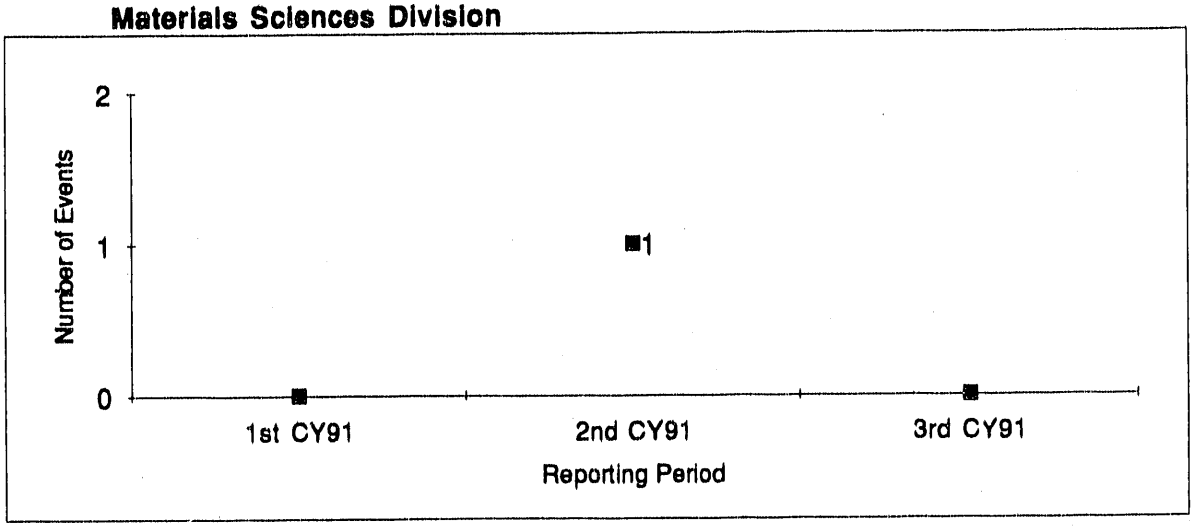
There were no environmental incidents in the current reporting period.

Root Cause of Occurrences



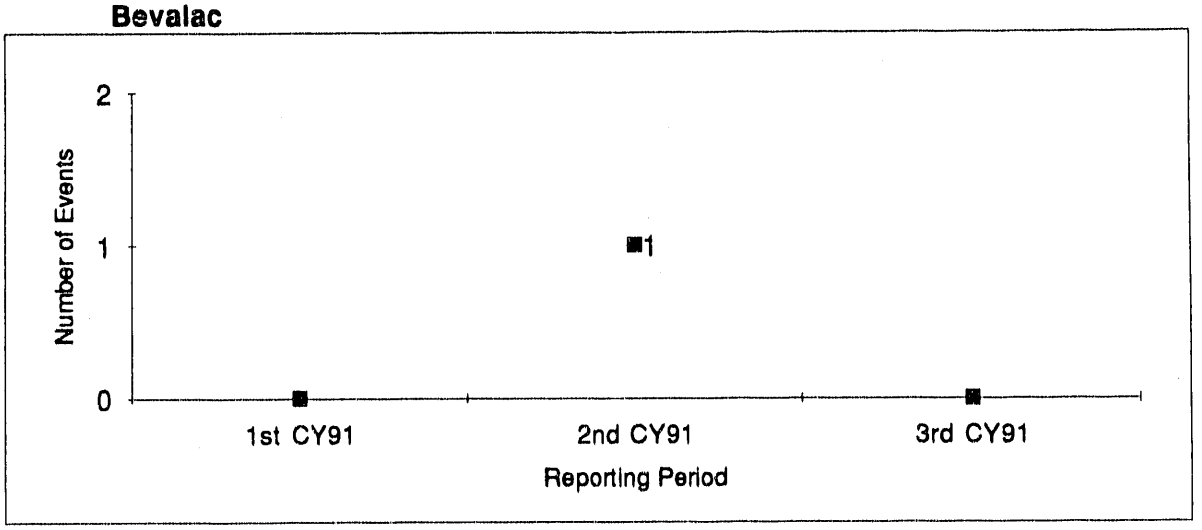
The above chart tracks the cumulative root causes of occurrence data. To date, there have been two (2) management causes and one (1) personnel cause of environmental incidents.

Materials Sciences Division

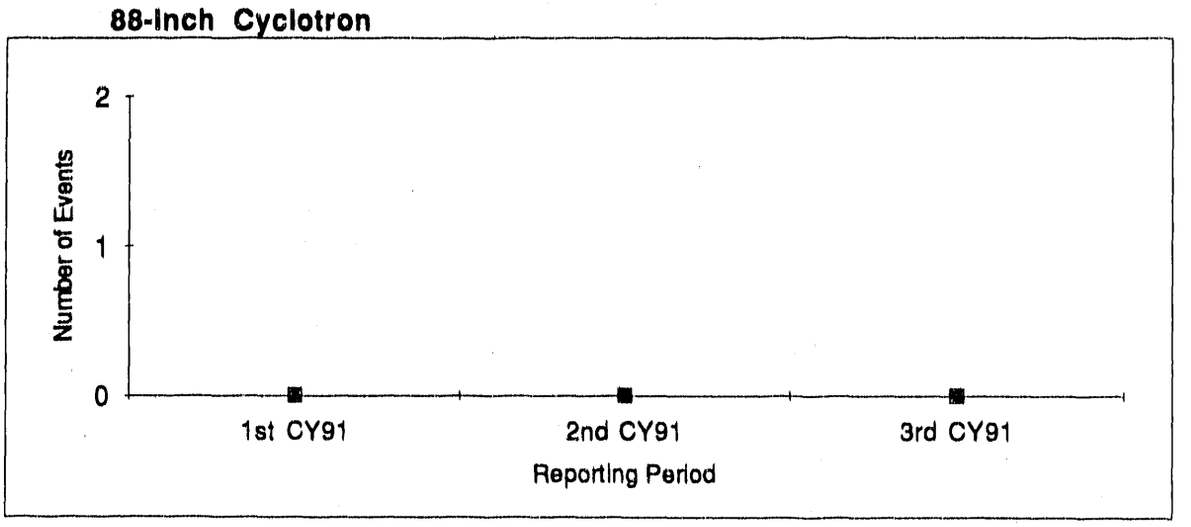


The above second quarter incident is reported in OR *SAN-LBL-MSD-1991-1001*.

Bevalac



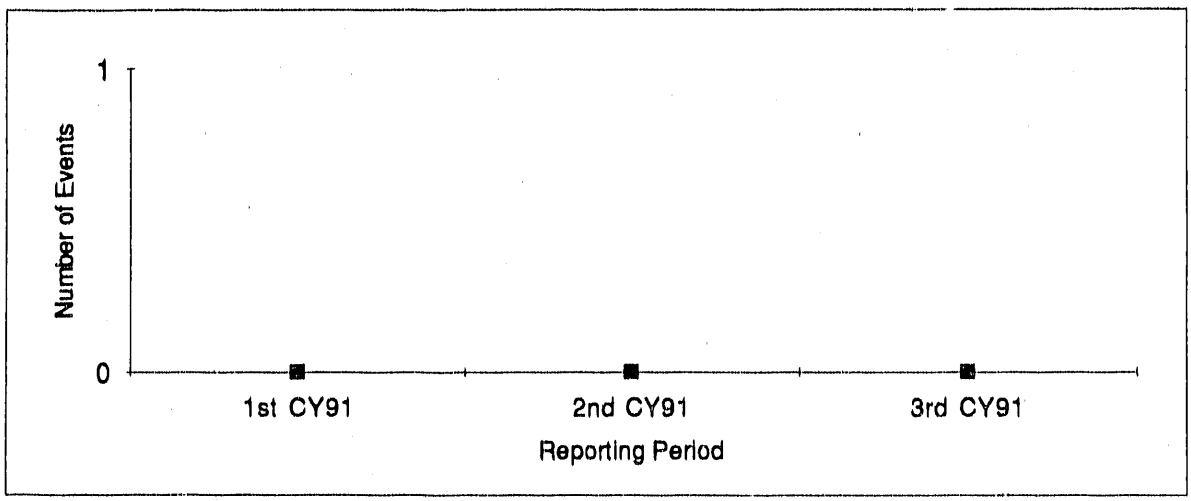
Although originally reported as two (2) second quarter incidents in the previous report, the OR *SAN-LBL-AFRD-1990-0007* was included in error. Only one (1) incident (*SAN-LBL-AFRD-1991-1001*) actually occurred in the second quarter.



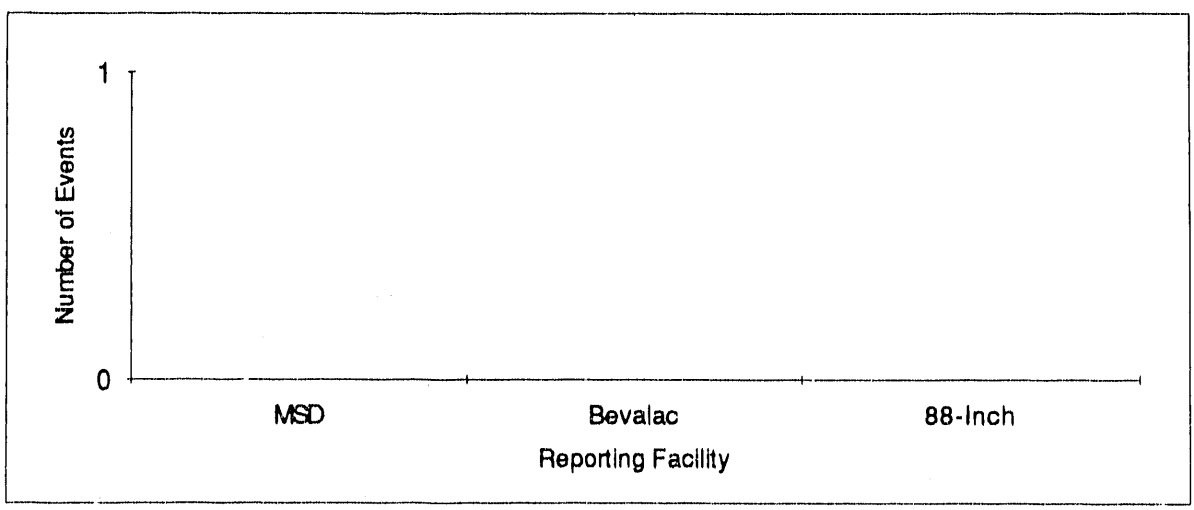
There have not been any environmental incidents at the 88-Inch facility in the past three quarters.

2.2 Unplanned Safety Function Actuations

The number of unplanned actuations of any safety function or facility safety systems that occur when an actuation setpoint for a safety fuction is reached or when a spurious or inadvertent signal is generated, and major equipment is actuated or demanded. Unplanned means that the actuation was not part of a planned test or evolution.



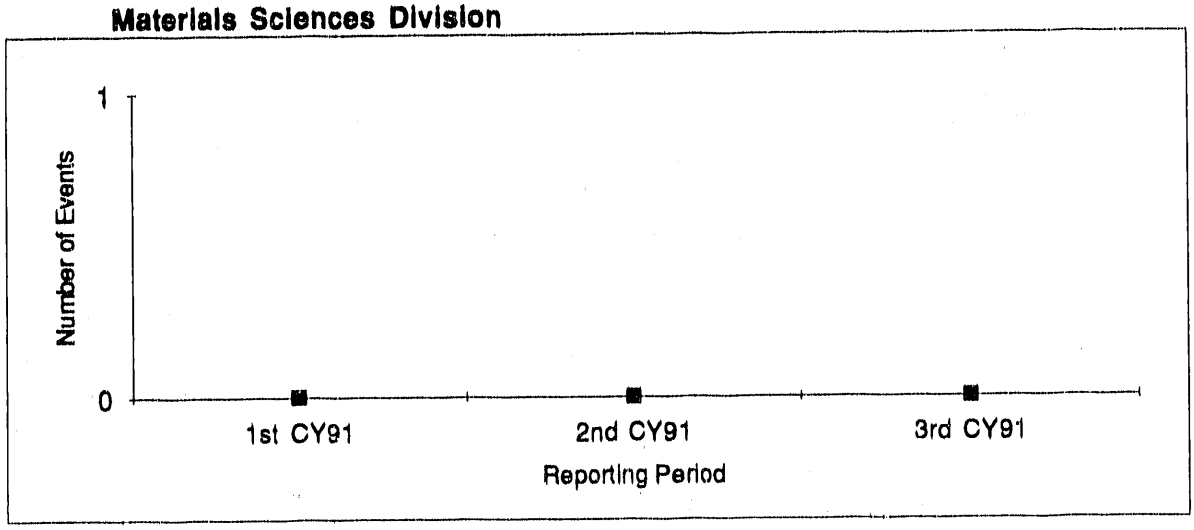
There have been no unplanned safety function acutations at LBL in the past three quarters.



Current Period Data

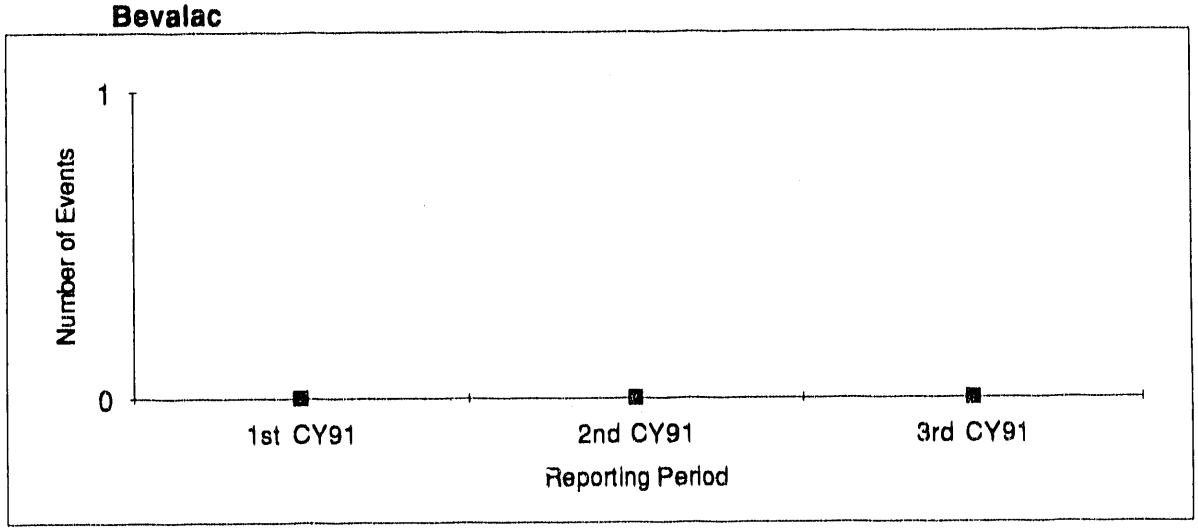
There were no unplanned safety function acutations in the present reporting period.

Materials Sciences Division

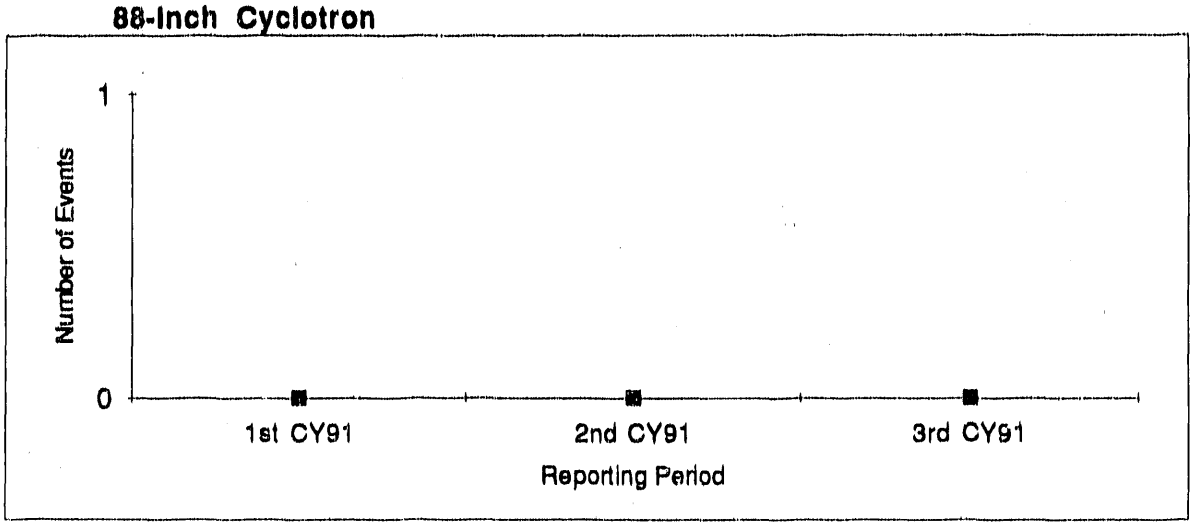


No unplanned safety function actuations.

Bevalac



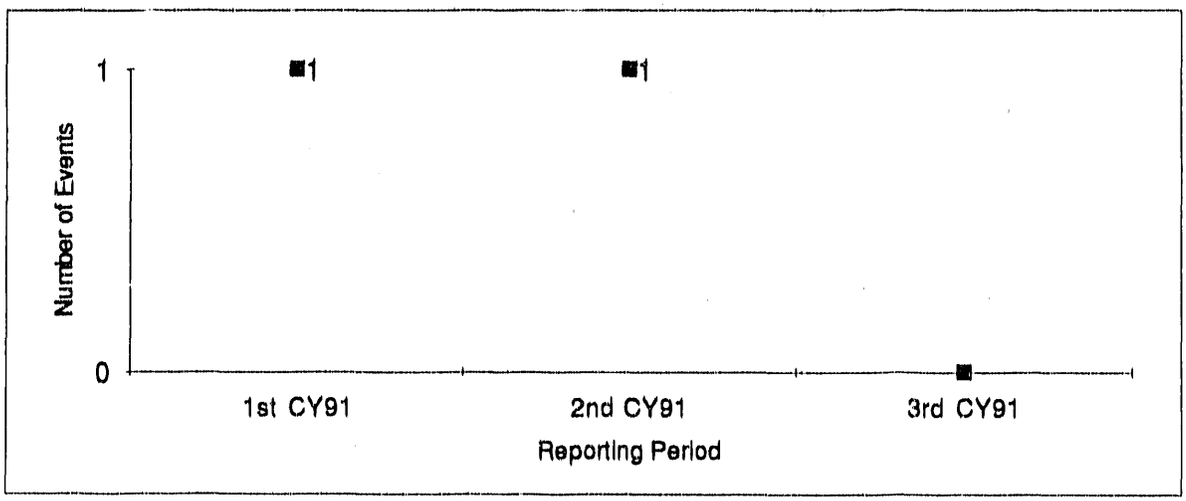
No unplanned safety function actuations.



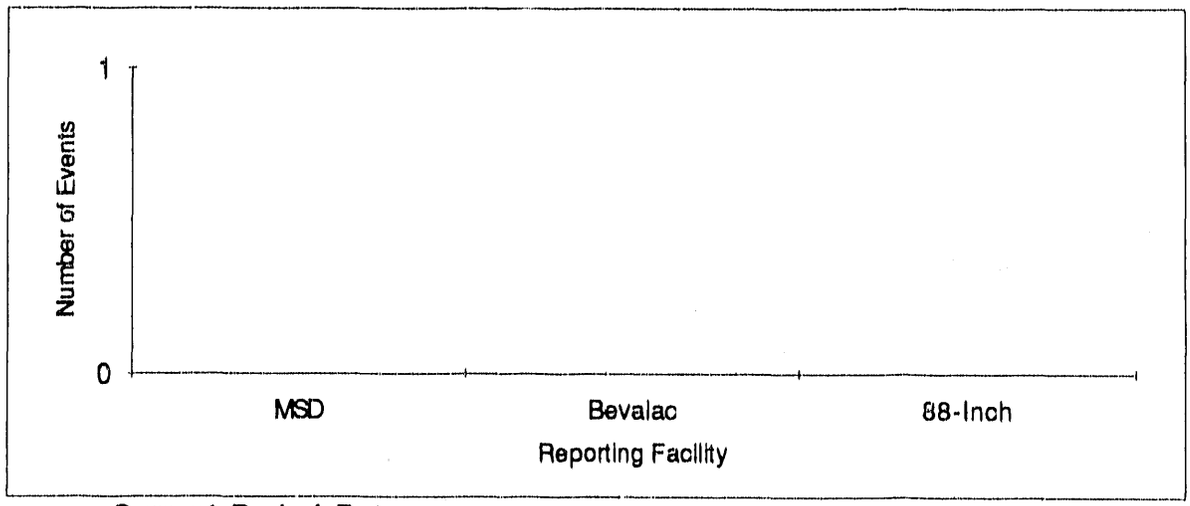
No unplanned safety function actuations.

2.3 Violations of Operating Procedures

The number of instances where a failure of personnel to follow operating procedures resulted in a reportable occurrence.

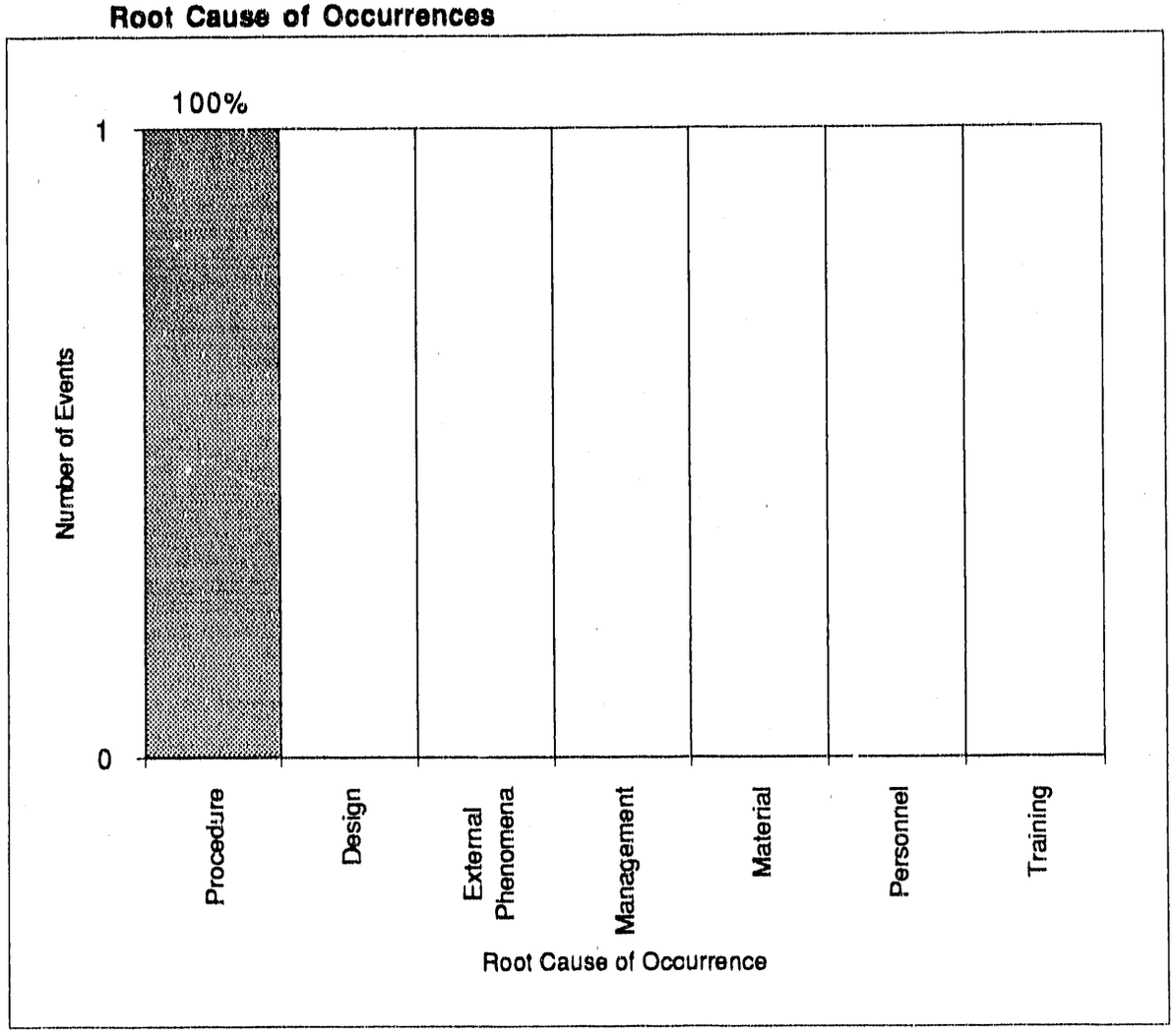


The violation in the first quarter has not been included in a PI report to date. (See MSD facility chart below). Also, in the previous PI report, it was stated that there were two violations of operating procedures in the second quarter. One of these occurred in 1990 and should not have been included. (See Bevalac facility chart below).



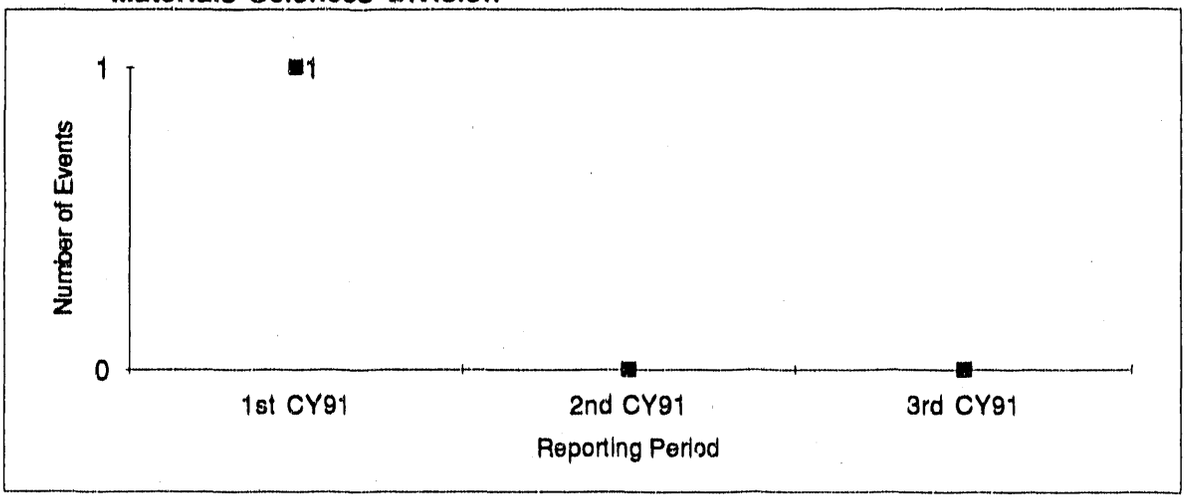
Current Period Data

There were no violations of operating procedures in the current reporting period.



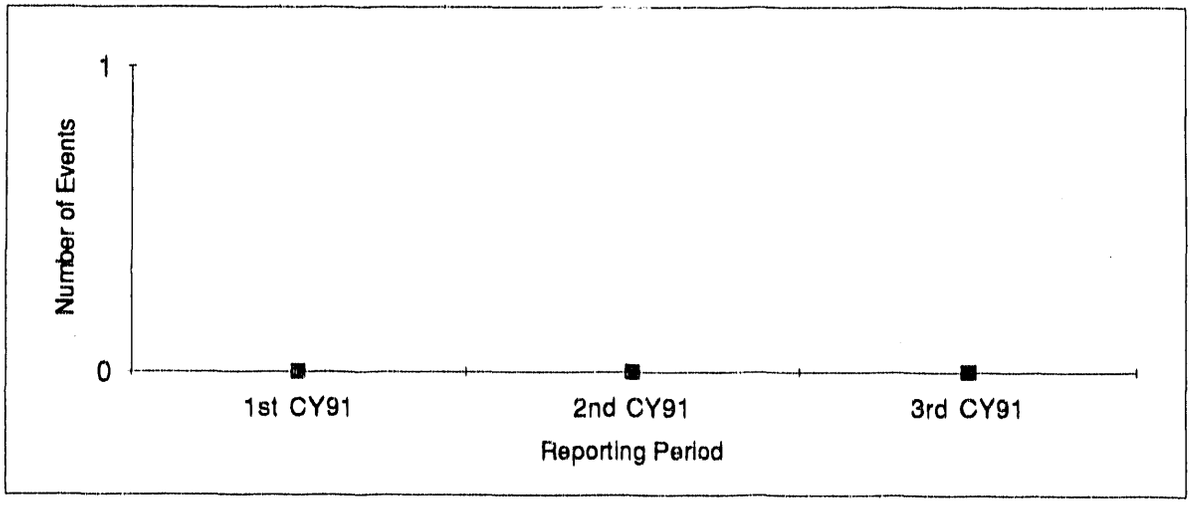
The first quarter violation of operating procedures (SAN-LBL-MSD-1991-1002) had *Procedure* as its root cause. The cause of the other violation (SAN-LBL-NSD-1991-1001, second quarter) has yet to be determined.

Materials Sciences Division

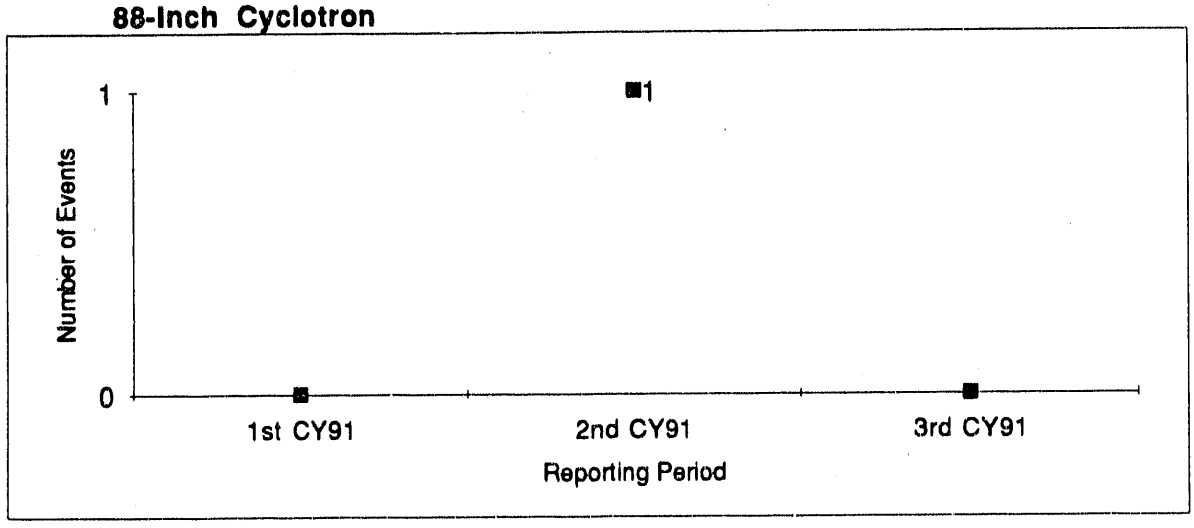


Although not reported in the previous two Performance Indicator reports, nor indicated on any errata sheet to date, there was in fact one (1) violation of operating procedures at the Material Science Division in the first quarter (OR SAN-LBL-MSD-1991-1002)

Bevalac



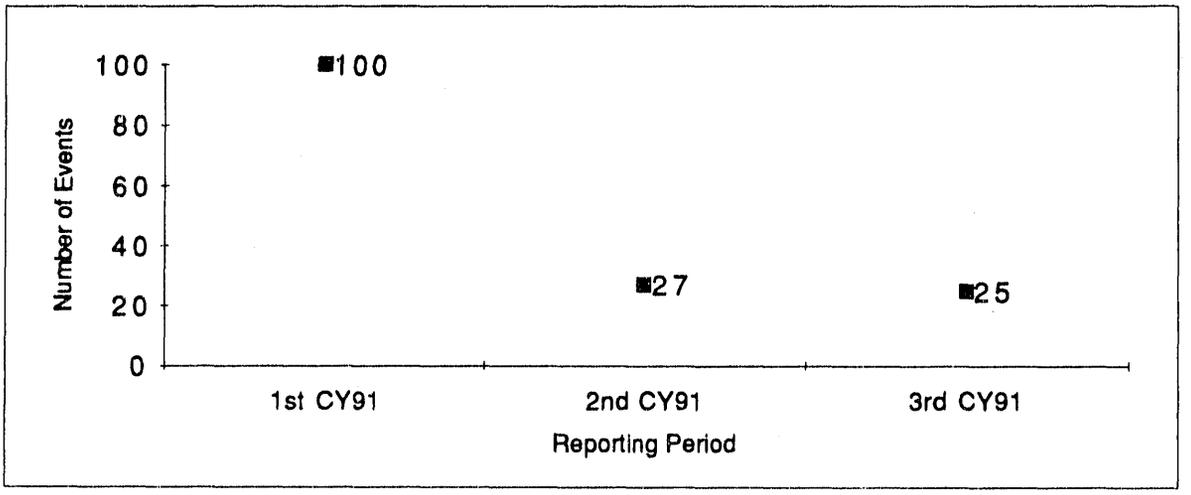
The violation reported for the second quarter in the previous report occurred, in fact, in 1990 and should not have been included. There have been no violations of operating procedures at the Bevalac facility to date.



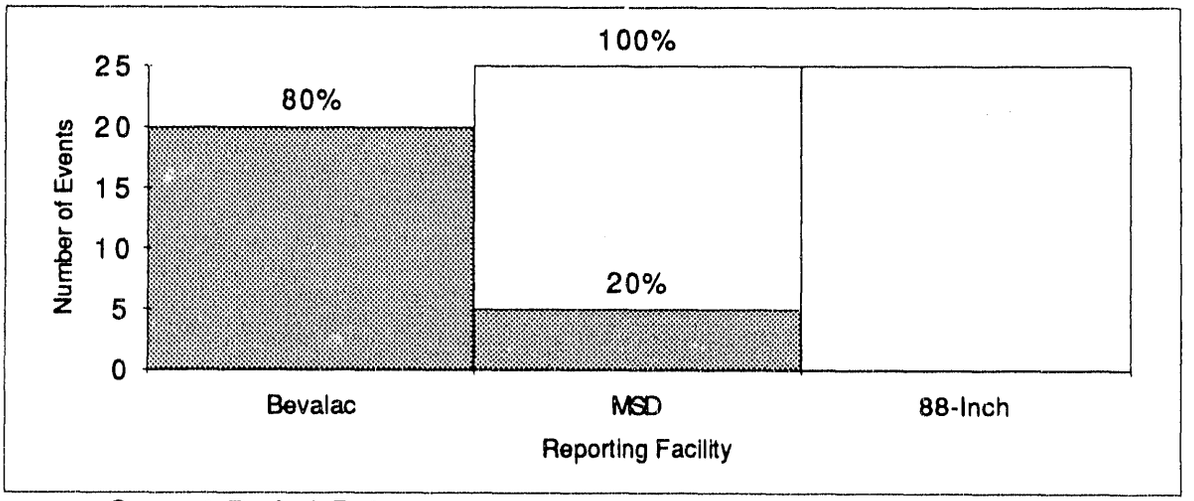
The one violation which has occurred at the 88-Inch Cyclotron facility (in the second quarter) was reported in OR *SAN-LBL-NSD-1991-1001*.

2.4 OSHA Violations

The total number of items of noncompliance with OSHA standards.



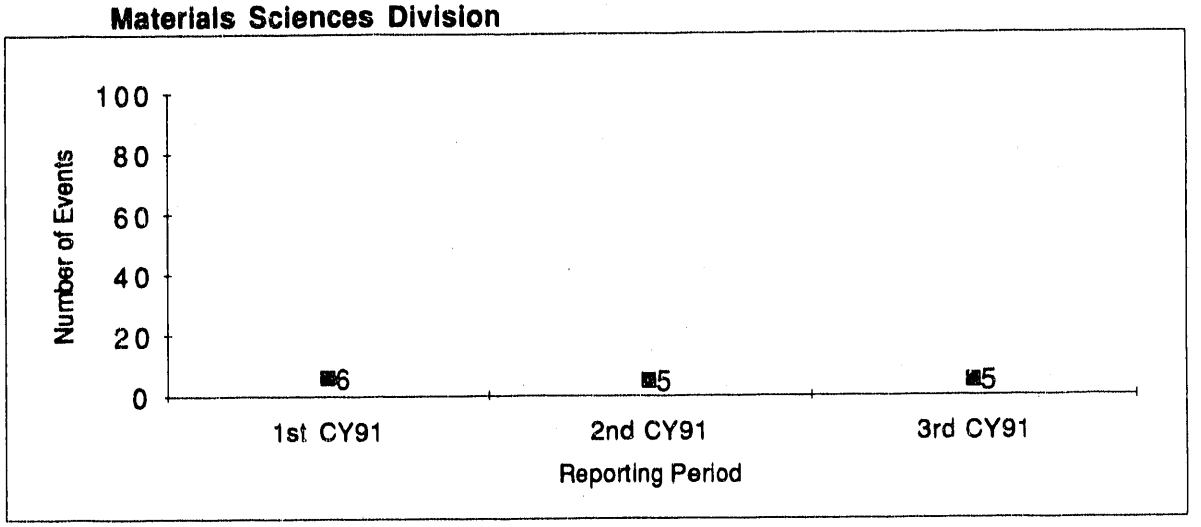
The substantially lower values over the past two quarters are due to the reduction of violations at the Bevalac facility. (See the facility charts below).



Current Period Data

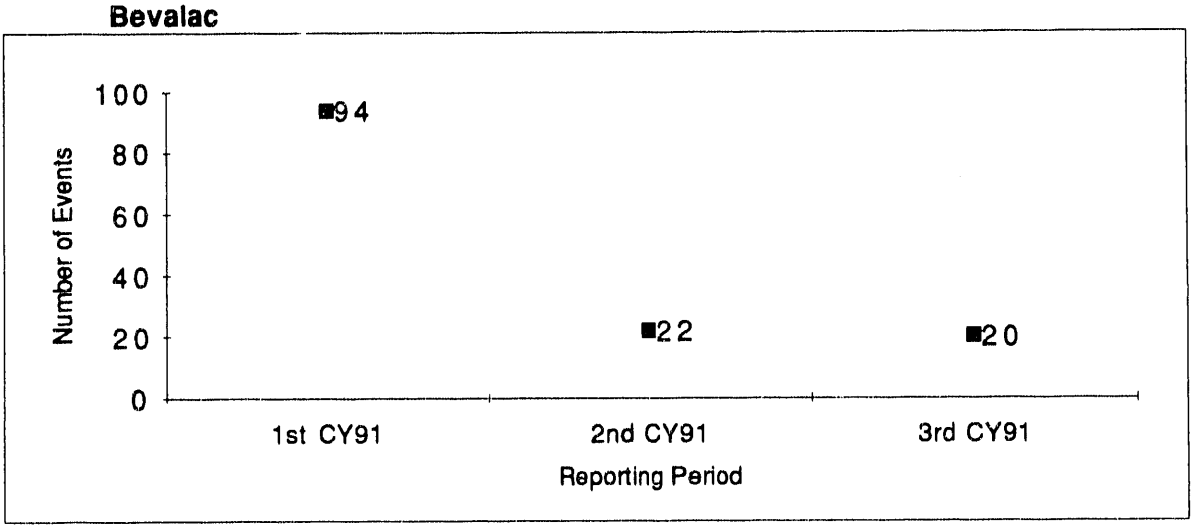
Despite the Bevalac facility having a second successive quarter of reduced OSHA violations (see the Bevalac facility chart below), it again has the most of the three LBL facilities by far.

Materials Sciences Division

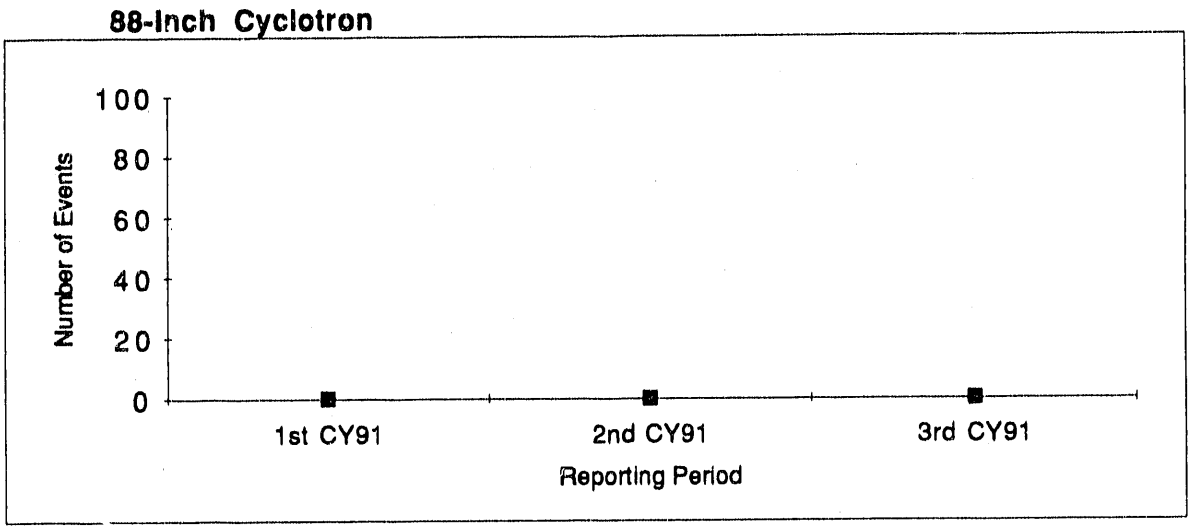


The number of OSHA violations in the Materials Sciences Division has remained relatively constant over the last three quarters.

Bevalac



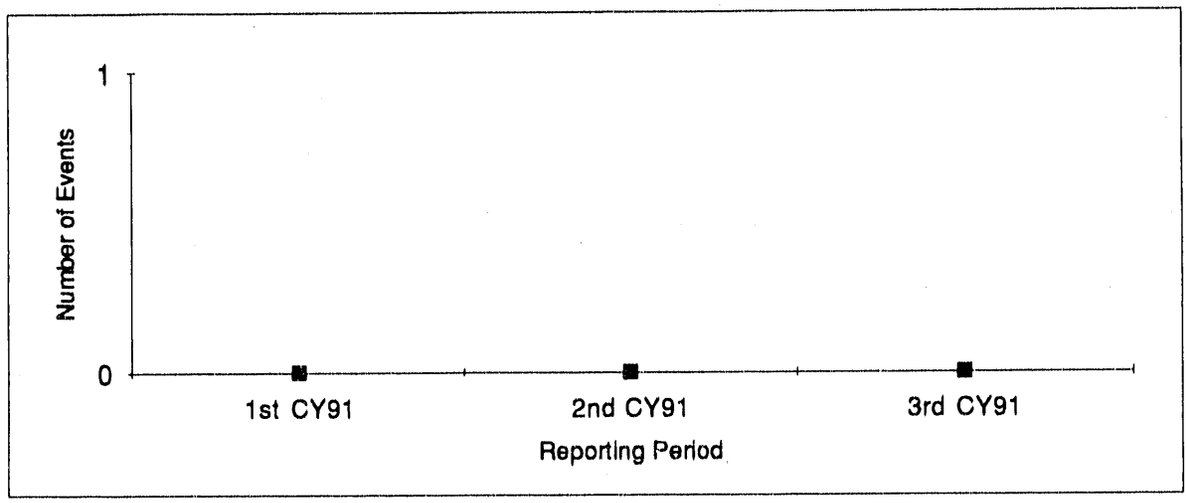
The Bevalac facility had a second successive quarter of reduced OSHA violations.



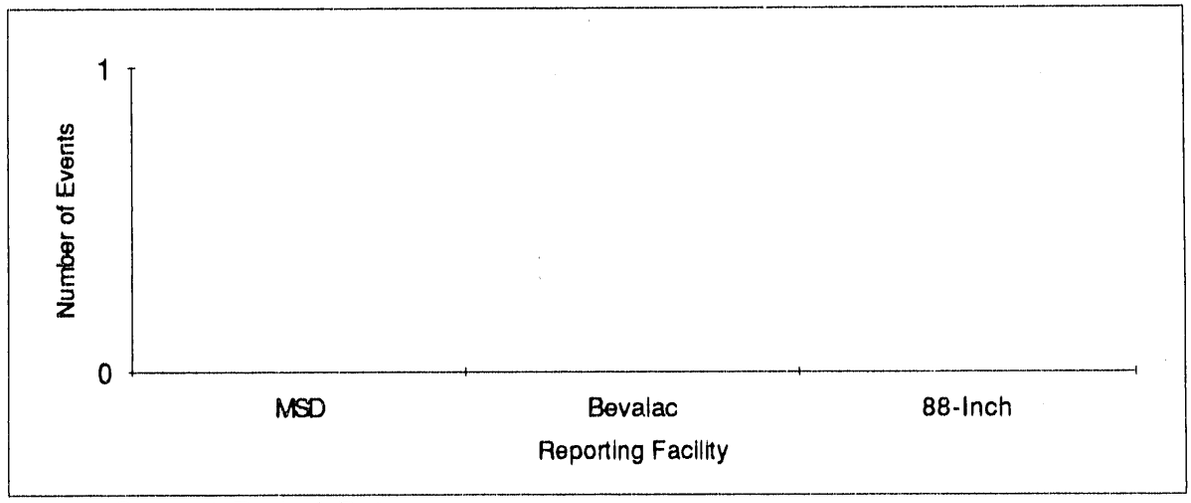
No OSHA violations to date.

2.5 Unplanned Shutdowns

The number of unscheduled shutdowns of a facility, process or operation.



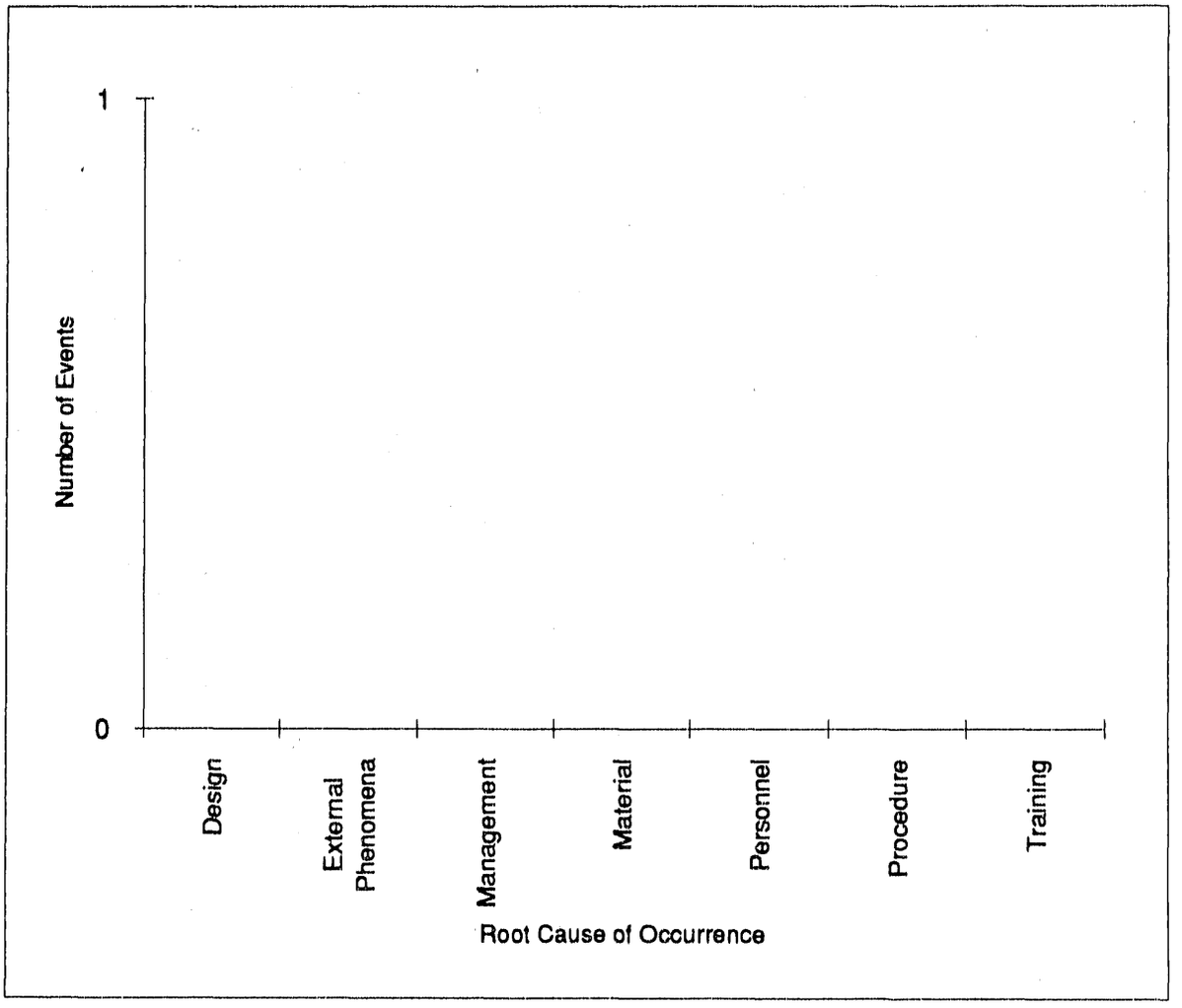
No unplanned shutdowns to date.



Current Period Data

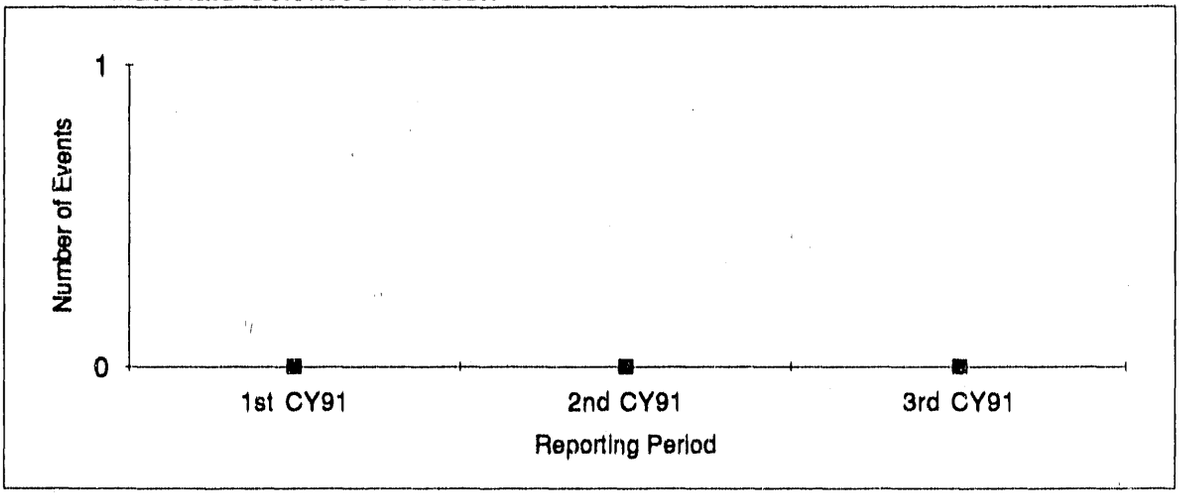
No unplanned shutdowns in the current reporting period.

Root Cause of Occurrences



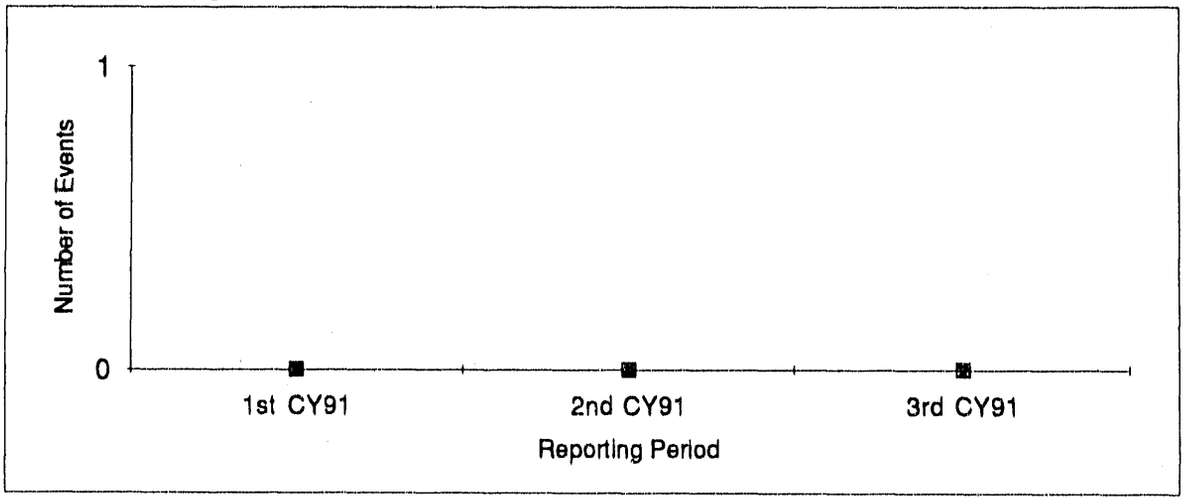
No unplanned shutdowns to date.

Materials Sciences Division

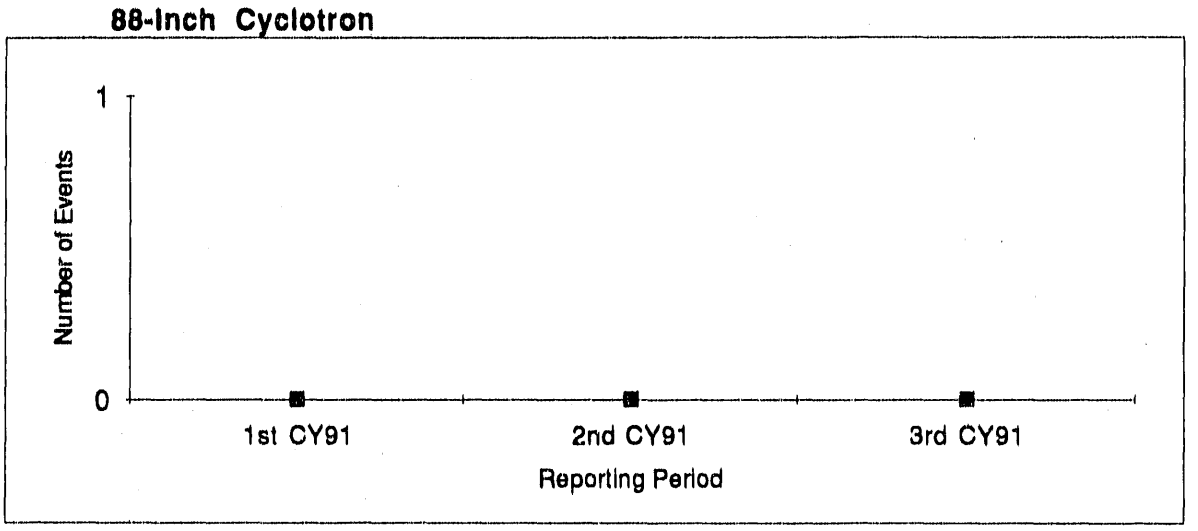


No unplanned shutdowns to date.

Bevalac



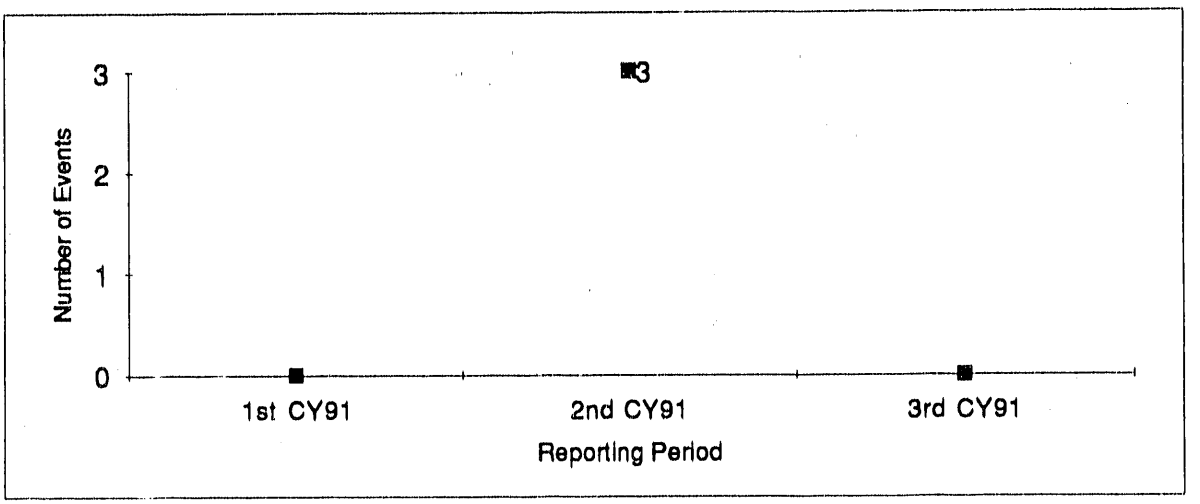
No unplanned shutdowns to date.



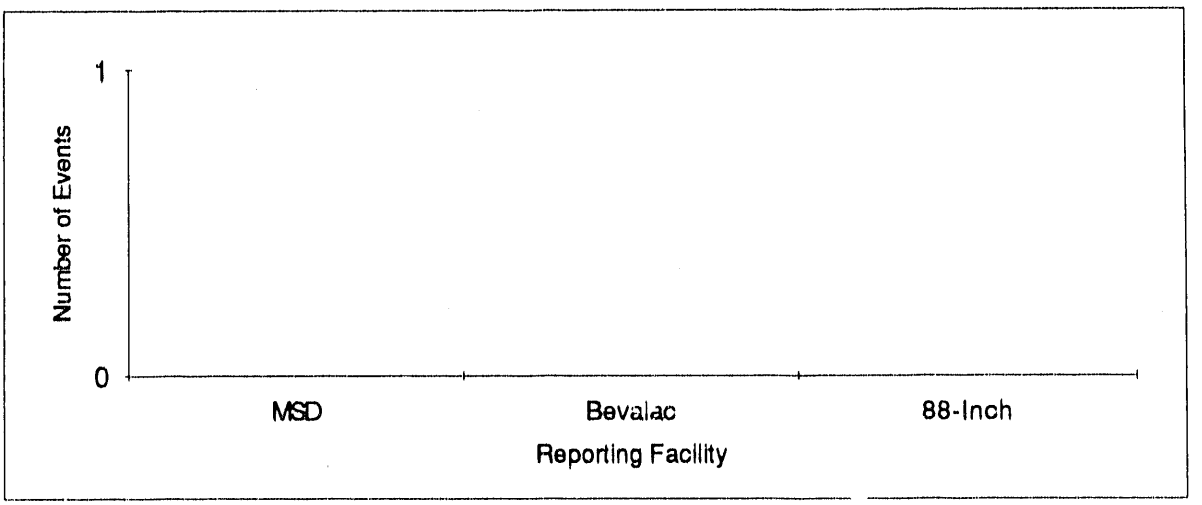
No unplanned shutdowns to date.

2.6 Emergency and Unusual Occurrences

The number of Emergency and Unusual Occurrences reported in accordance with DOE Order 5000.3A, "Occurrence Reporting and Processing of Operations Information."



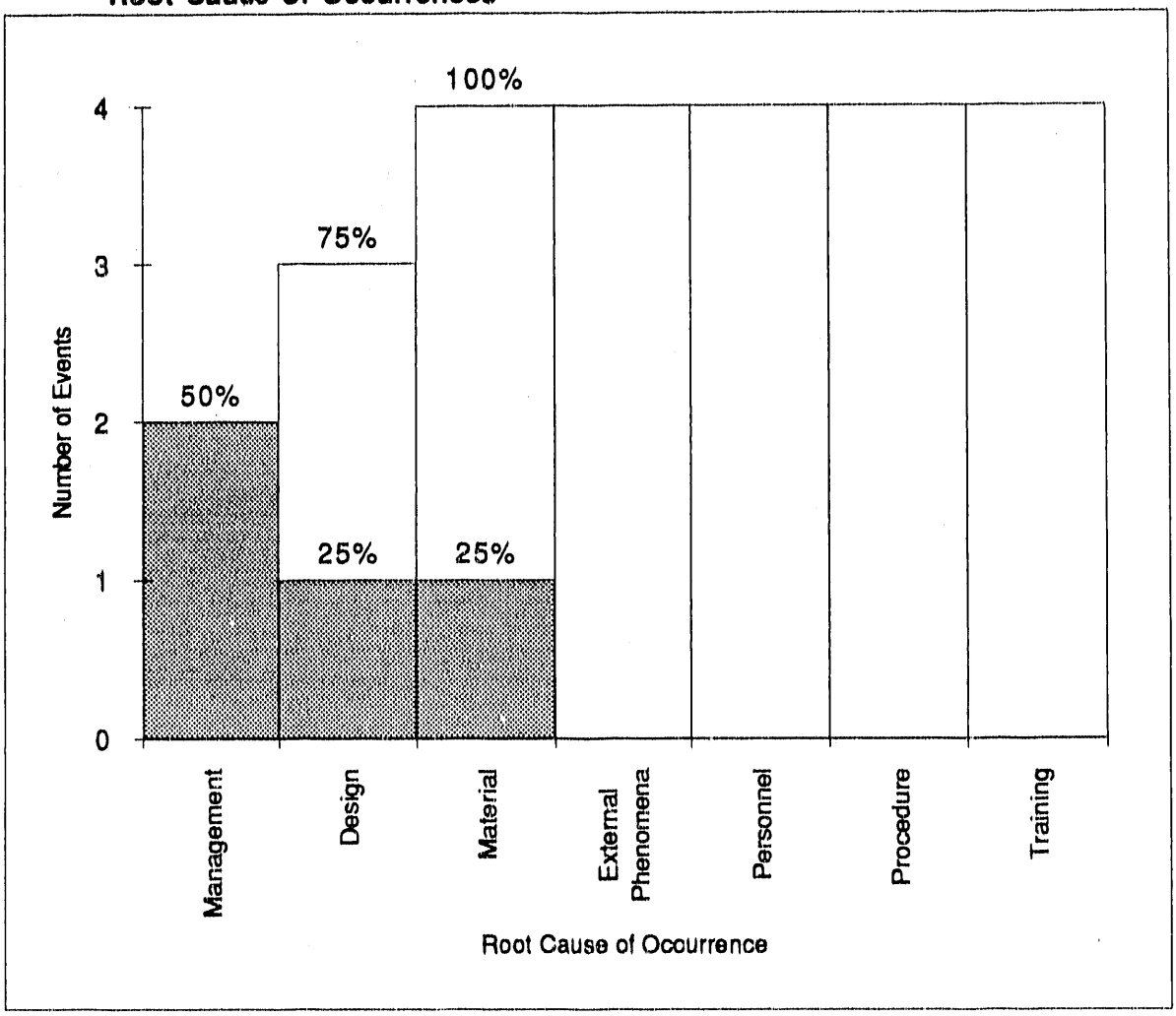
The second quarter data were previously reported as two (2) occurrences. There was, in fact, a third which occurred in the Material Science Division (see the MSD facility chart below).



Current Period Data

No emergency or unusual occurrences during the current reporting period.

Root Cause of Occurrences

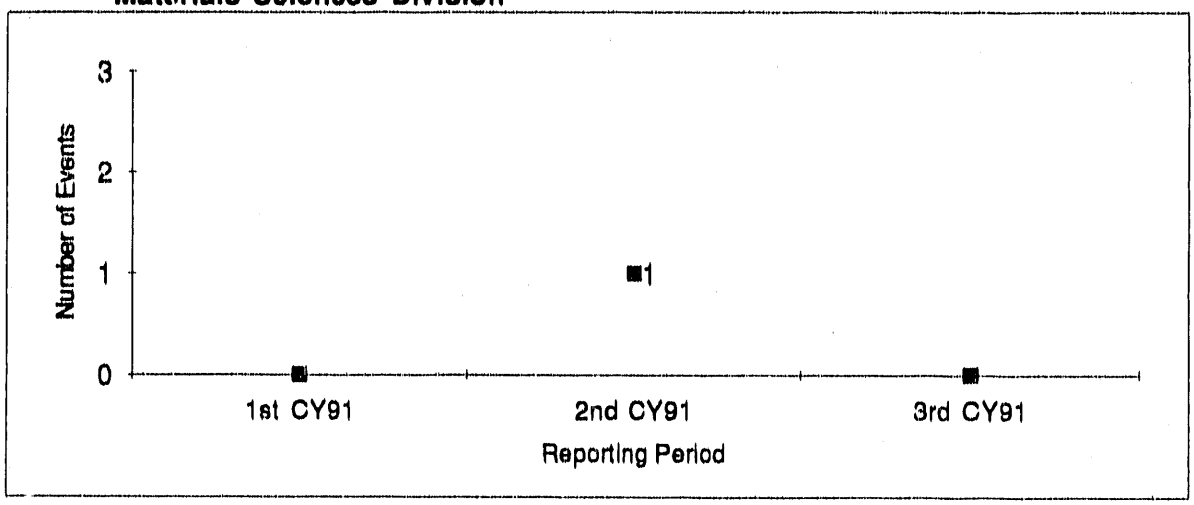


The chart shows the root causes of the following occurrences:

SAN-LBL-AFRD-1991-1001 (2nd qtr):	Management
SAN-LBL-AFRD-1990-0028 (1990):	Management
SAN-LBL-MSD-1991-1003 (1990):	Design
SAN-LBL-MSD-1991-1004 (2nd qtr.):	Material

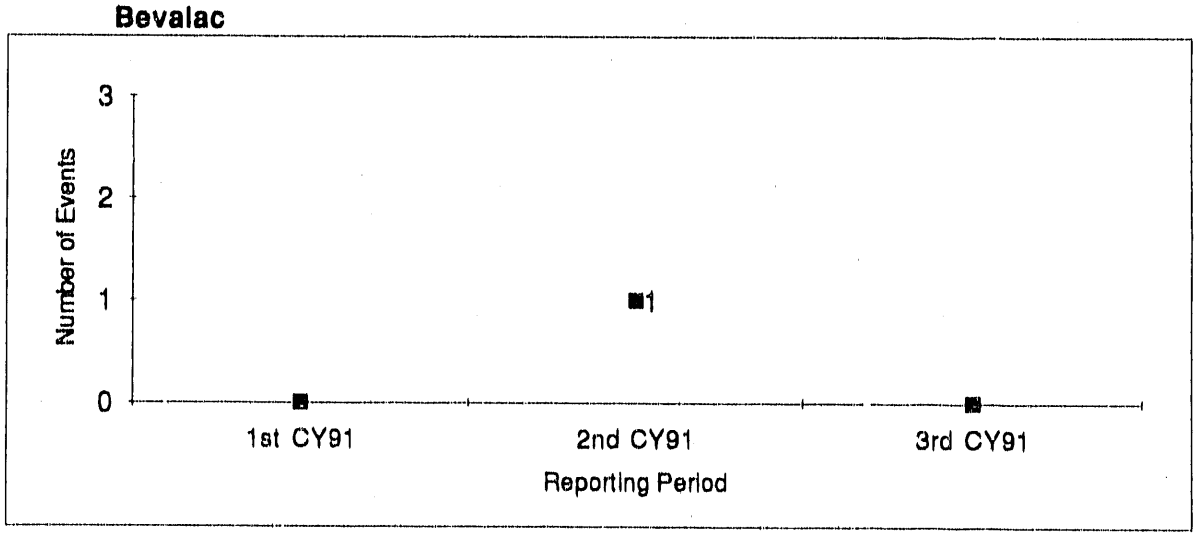
The root cause of a fifth unusual occurrence, which took place in the second quarter of 1991 (SAN-LBL-NSD-1991-1001), has yet to be determined.

Materials Sciences Division

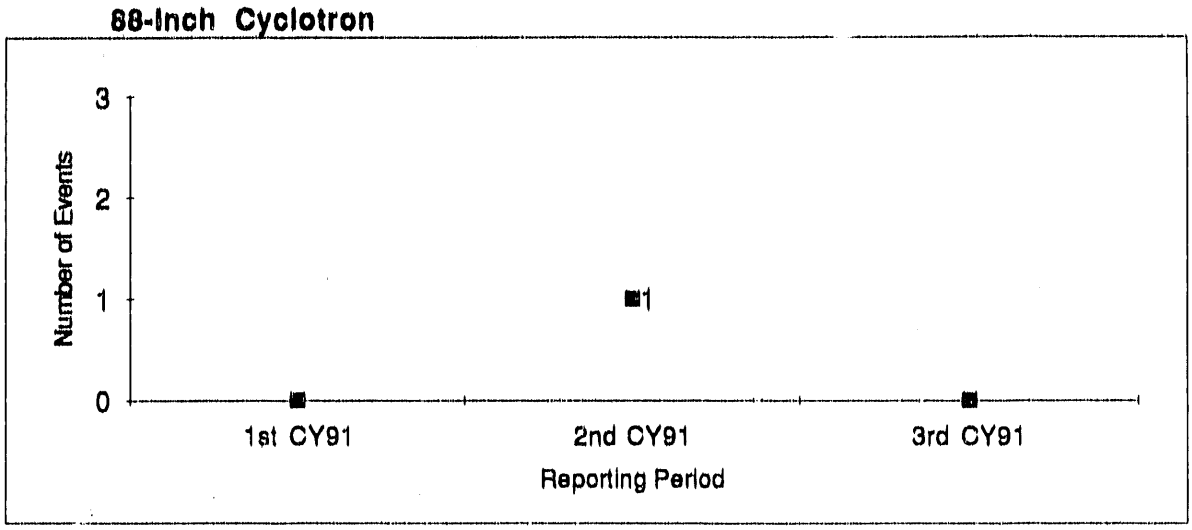


Although not reported in any previous PI report, nor on any errata sheet, there was, in fact, an unsual occurrence in the MSD during the second quarter. It was reported in OR *SAN-LBL-MSD-1991-1004*.

Bevalac



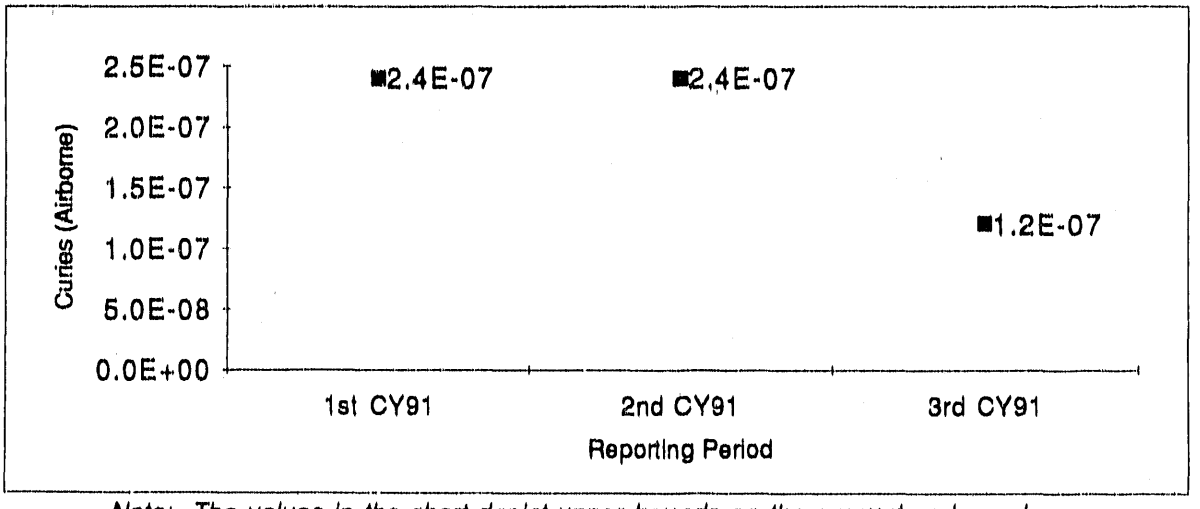
The above second quarter occurrence was reported in OR *SAN-LBL-AFRD-1991-1001*.



The above second quarter occurrence was reported in OR *SAN-LBL-NSD-1991-1001.*

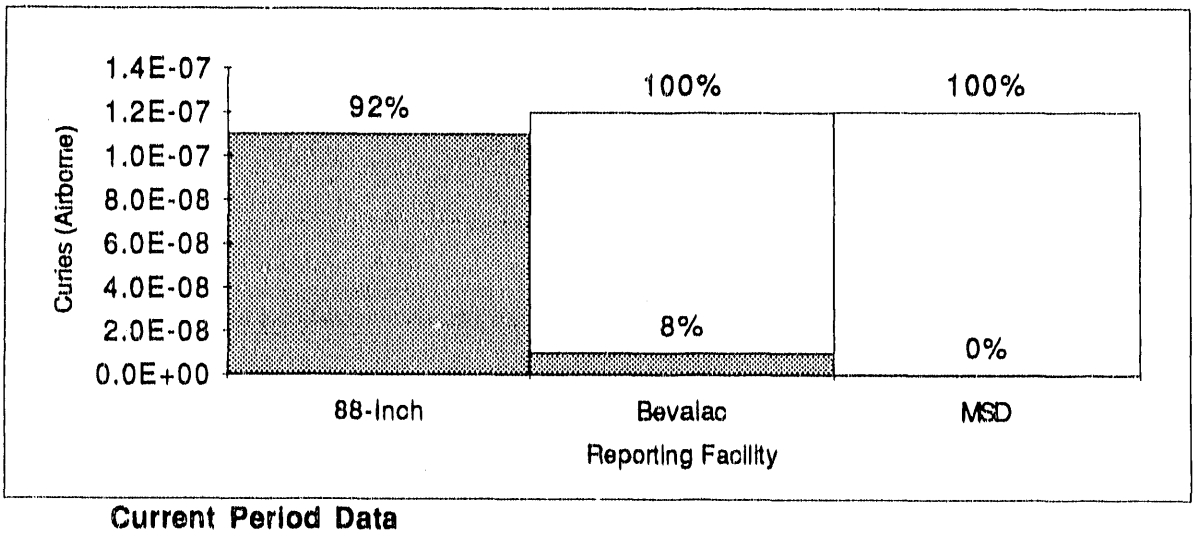
3.1.1 Radionuclide Effluent Releases (Airborne)

Airborne releases to the environment, as measured at the point of release, for the following radionuclides: plutonium, uranium, nobel gases, particulates (including radiocesiums and radiostrontium, and activation products), radioiodine, tritium, and other actinides.



Note: The values in the chart depict upper bounds on the amounts released.

To date, the amounts of airborne radionuclide effluent releases from LBL have been statistically insignificant.

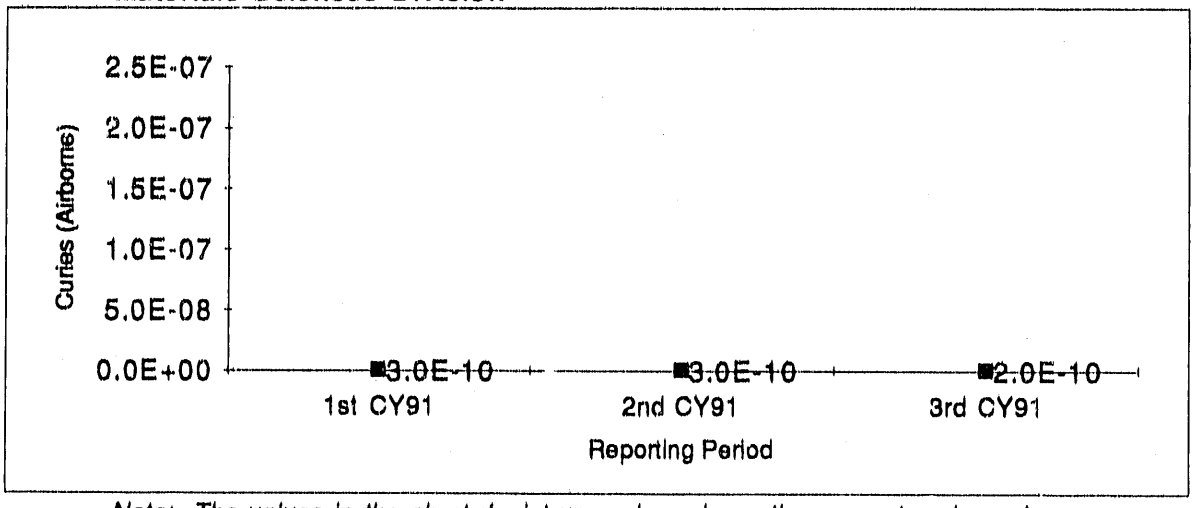


Current Period Data

Note: The values in the chart depict upper bounds on the amounts released.

Although the 88" facility released more airborne radionuclide than the other two facilities by far, the actual amount released (less than 1.1E-07 Curies) is negligible.

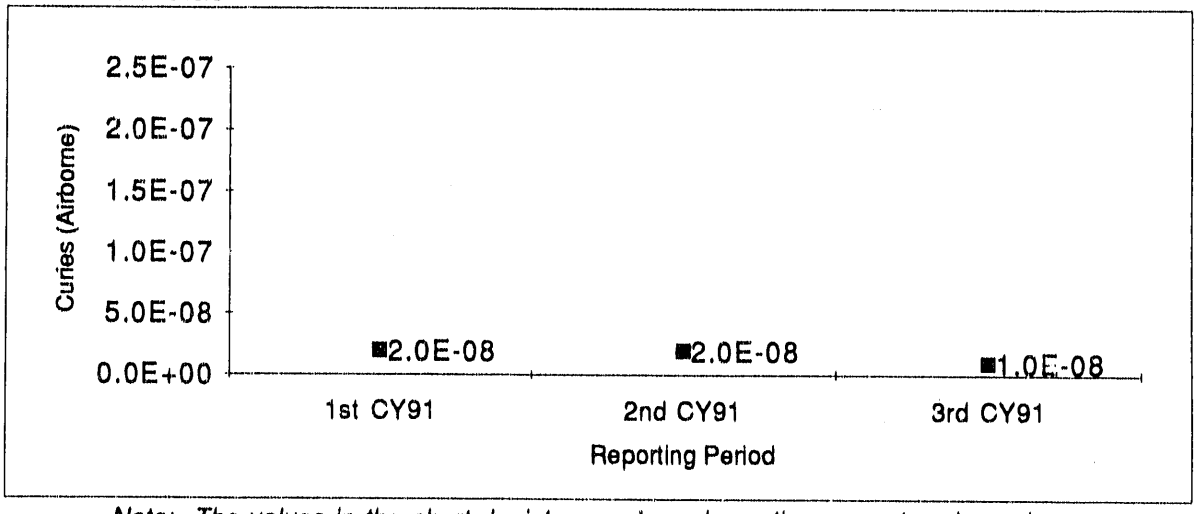
Materials Sciences Division



Note: The values in the chart depict upper bounds on the amounts released.

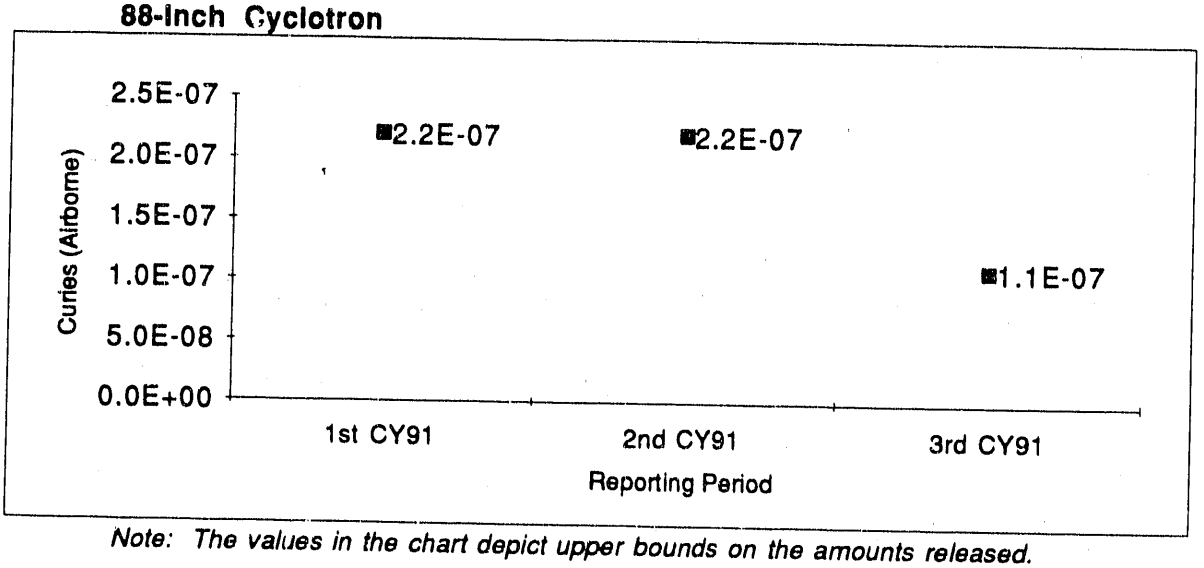
Negligible to date.

Bevalac



Note: The values in the chart depict upper bounds on the amounts released.

Negligible to date.

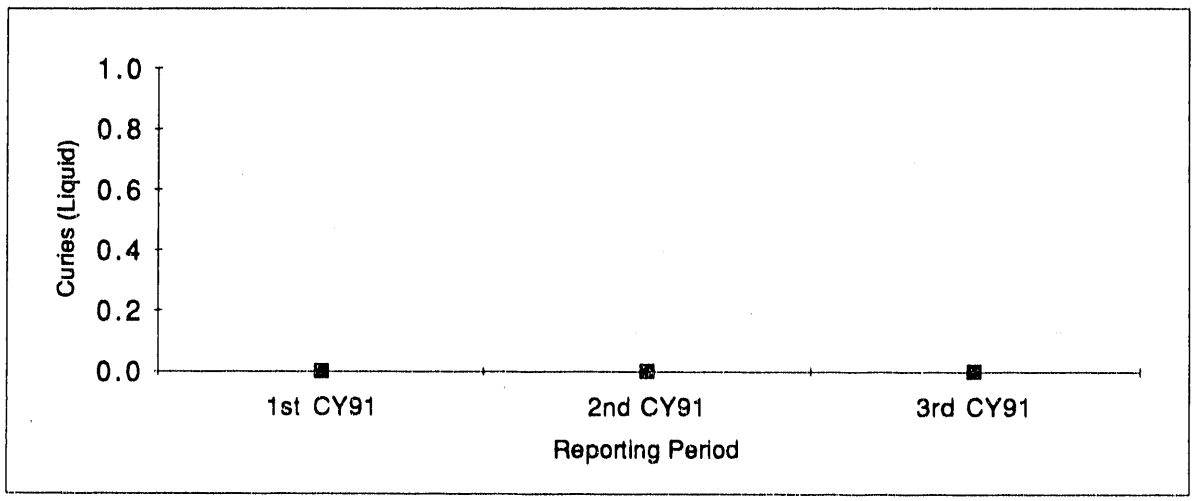


Note: The values in the chart depict upper bounds on the amounts released.

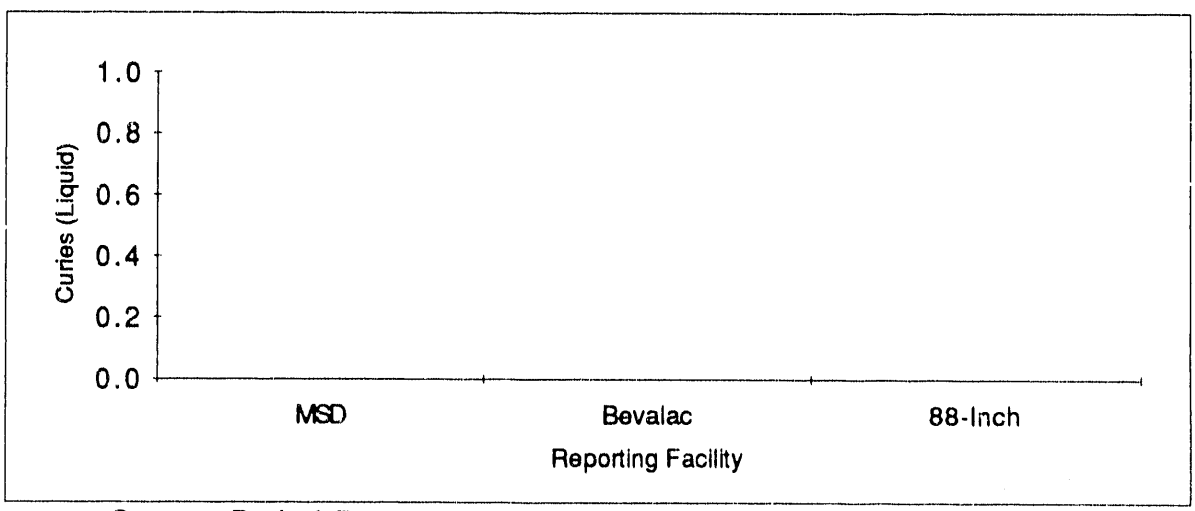
Negligible to date.

3.1.2 Radionuclide Effluent Releases (Liquid)

Liquid releases to the environment, as measured at the point of release, for the following radionuclides: plutonium, uranium, nobel gases, particulates (including radiocesiums and radiostrontium, and activation products), radioiodine, tritium, and other actinides.



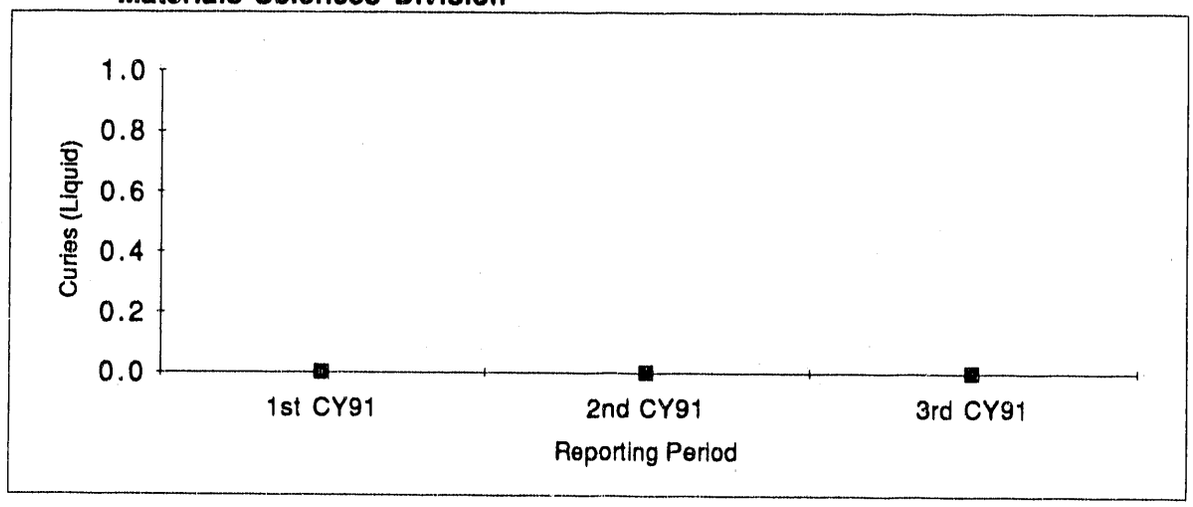
No liquid radionuclide effluent releases to date.



Current Period Data

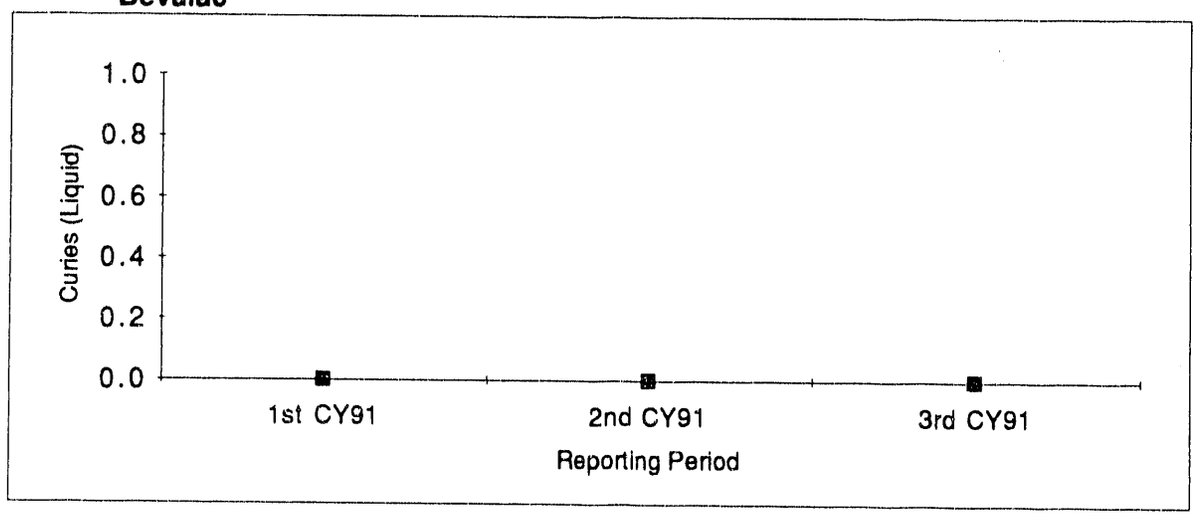
No liquid radionuclide effluent releases during this reporting period.

Materials Sciences Division



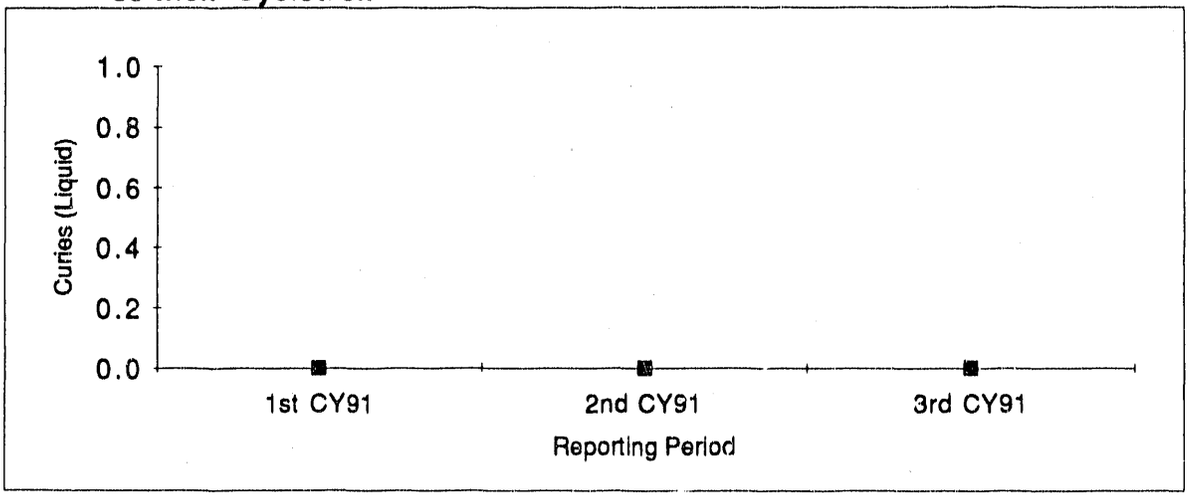
No liquid radionuclide effluent releases to date.

Bevalac



No liquid radionuclide effluent releases to date.

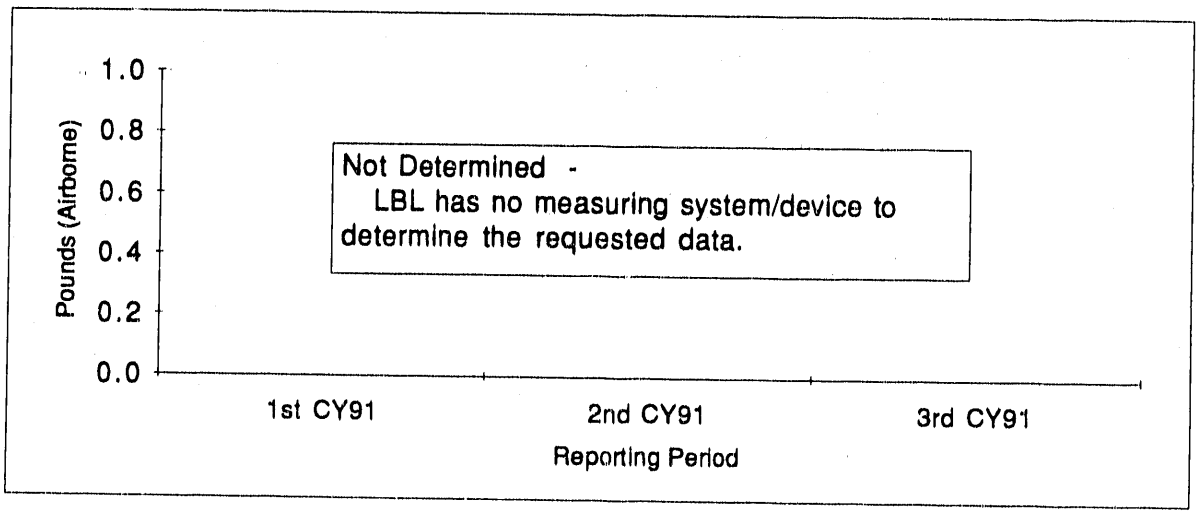
88-Inch Cyclotron

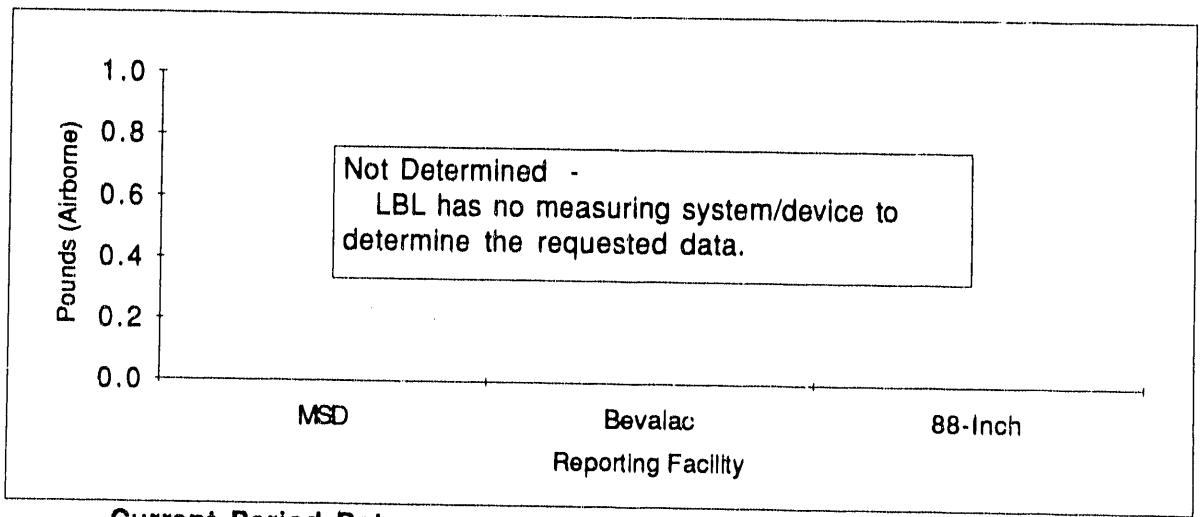


No liquid radionuclide effluent releases to date.

3.2.1 Hazardous Substance/Regulated Pollutant Effluent Release (Airborne)

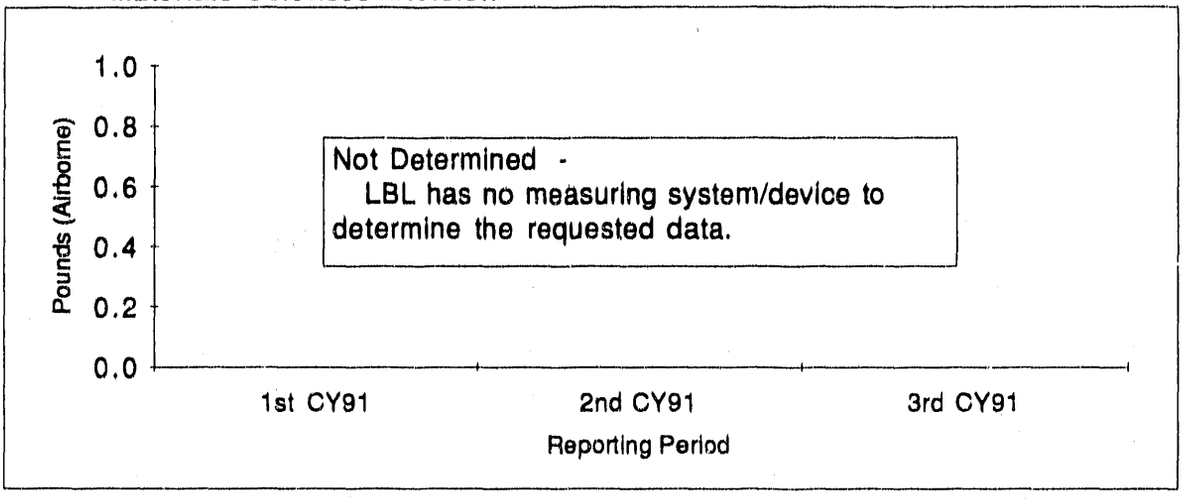
The amount of "permitted" airborne non-radioactive releases. All hazardous substances and regulated pollutants that are listed in permits (e.g., Clean Air Act or NPDES permits) or otherwise reported to regulators (e.g., through SARA Title III, Section 313 reporting requirements) are included. Data shall be cumulative over the reporting period and reported in units of pounds.



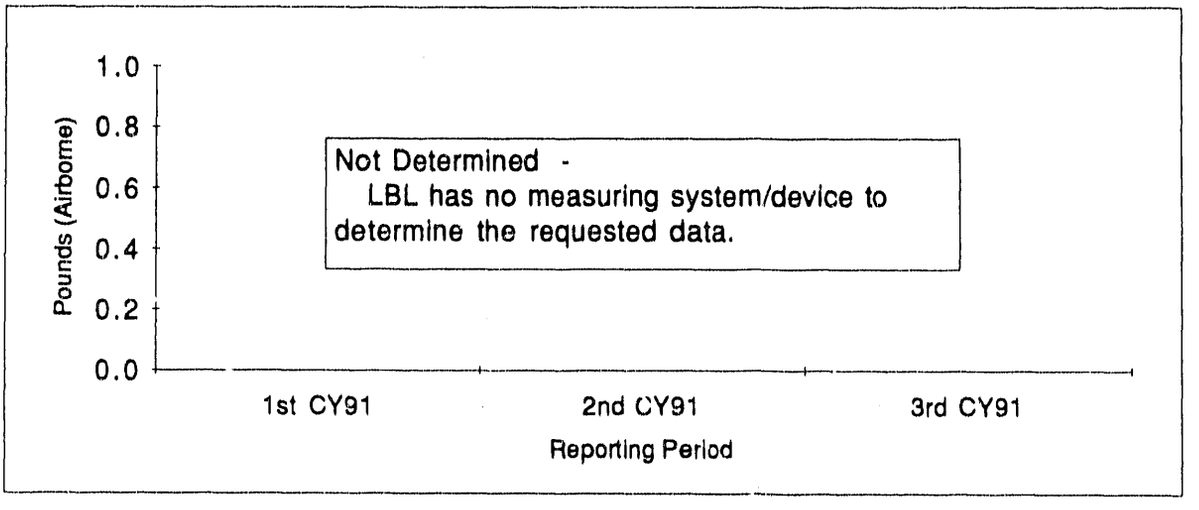


Current Period Data

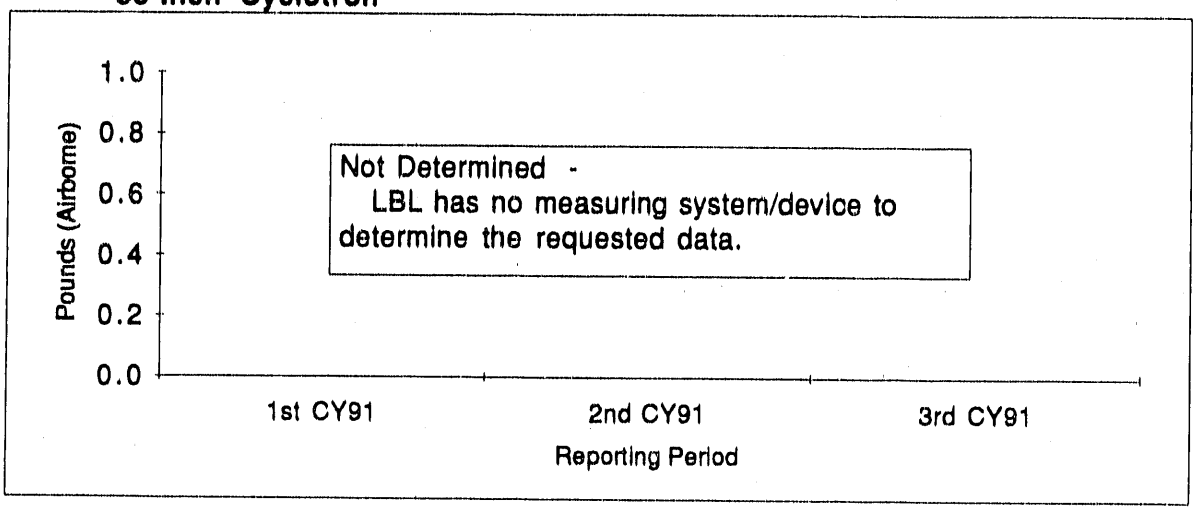
Materials Sciences Division



Bevalac

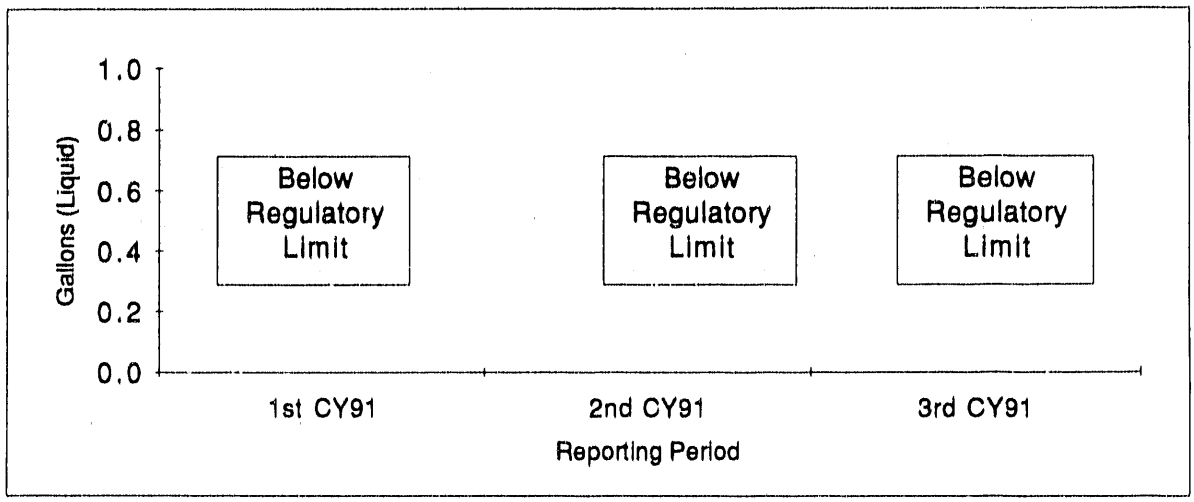


88-Inch Cyclotron

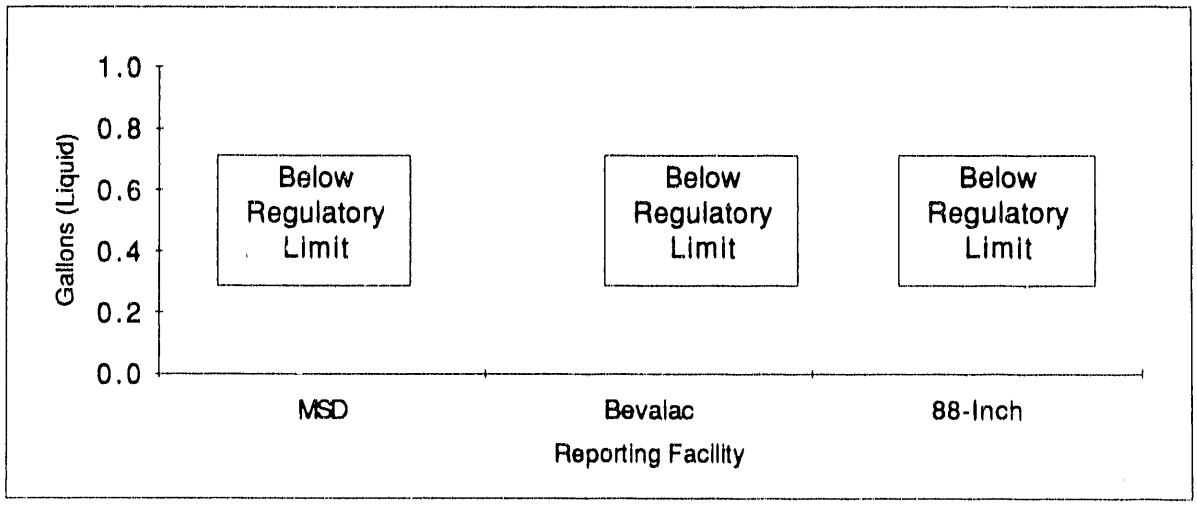


3.2.2 Hazardous Substance/Regulated Pollutant Effluent Releases (Liquid)

The amount of "permitted" liquid non-radioactive releases. All hazardous substances and regulated pollutants that are listed in permits (e.g., Clean Air Act or NPDES permits) or otherwise reported to regulators (e.g., through SARA Title III, Section 313 reporting requirements) are included. Data shall be cumulative over the reporting period and reported in units of gallons.



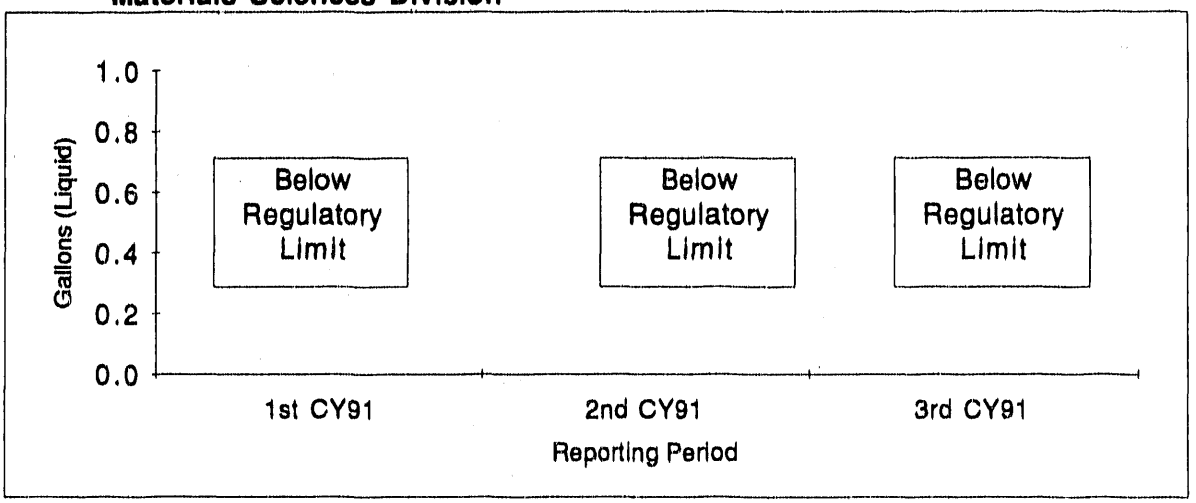
To date, the amounts of liquid hazardous substances and/or regulated pollutant effluent releases have been the below regulatory limit.



Current Period Data

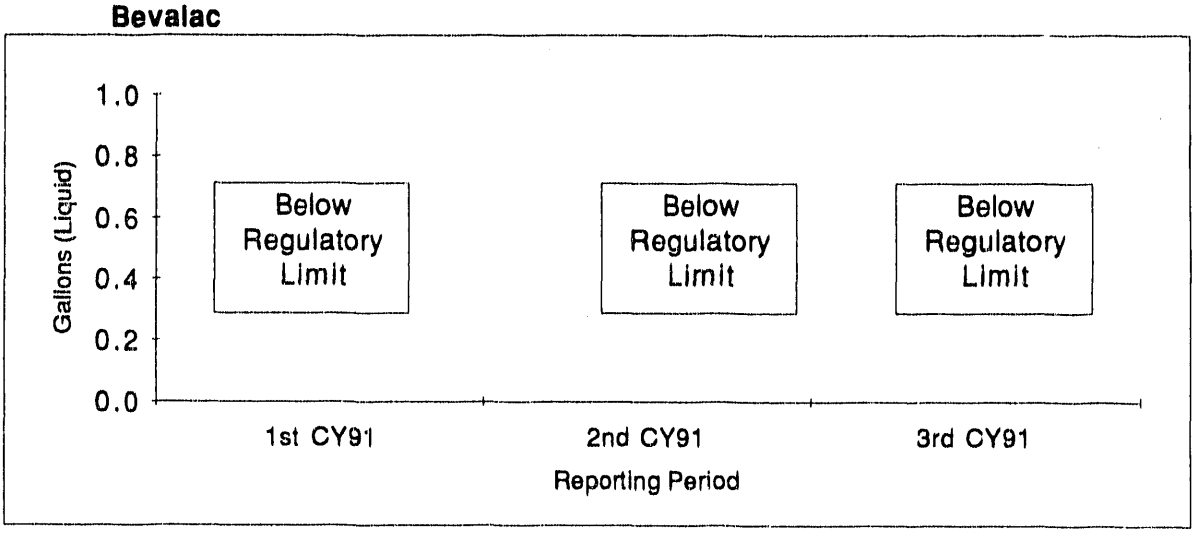
The amounts of liquid hazardous substances and/or regulated pollutant effluent releases were below regulatory limit during this reporting period.

Materials Sciences Division



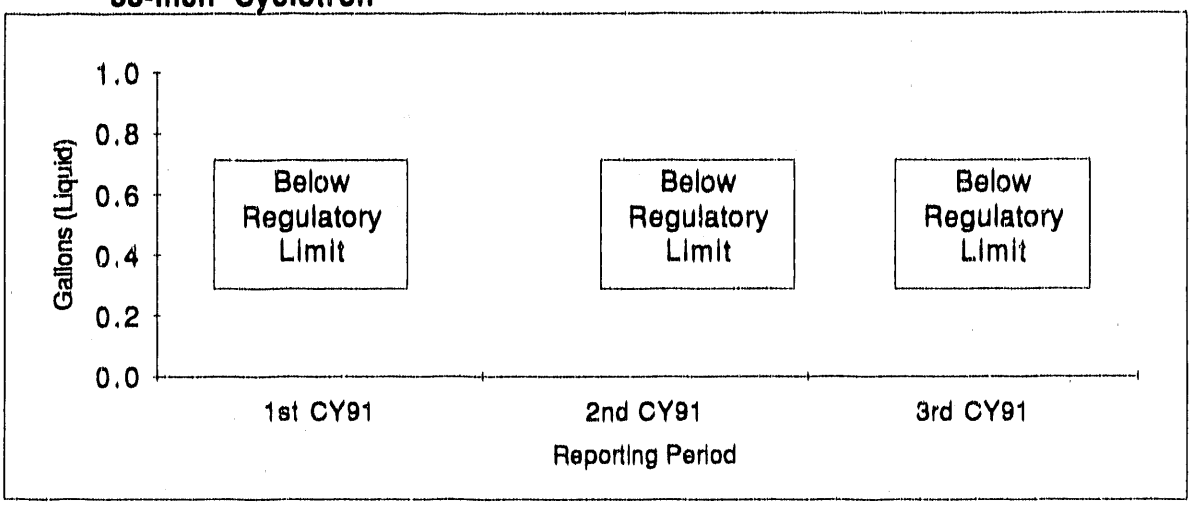
To date, the amounts of liquid hazardous substances and/or regulated pollutant effluent releases have been the below regulatory limit.

Bevalac



To date, the amounts of liquid hazardous substances and/or regulated pollutant effluent releases have been the below regulatory limit.

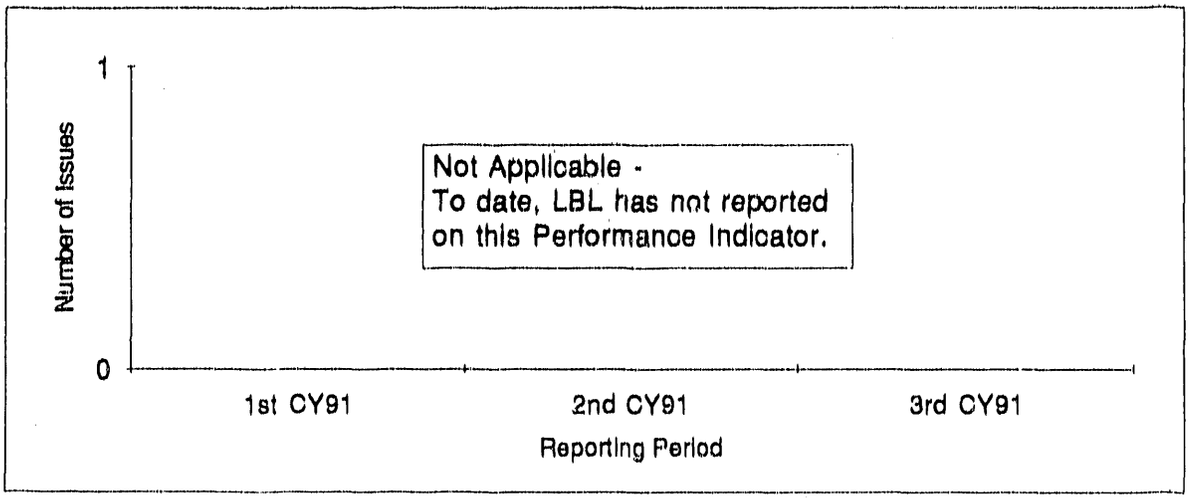
88-Inch Cyclotron

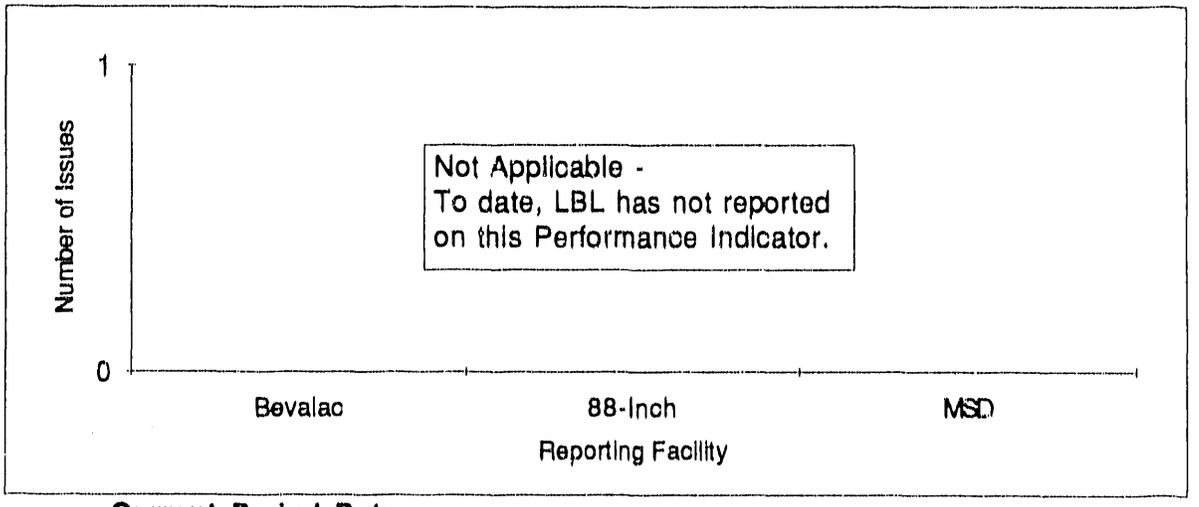


To date, the amounts of liquid hazardous substances and/or regulated pollutant effluent releases have been the below regulatory limit.

4.1 Open DOE Audit Issues

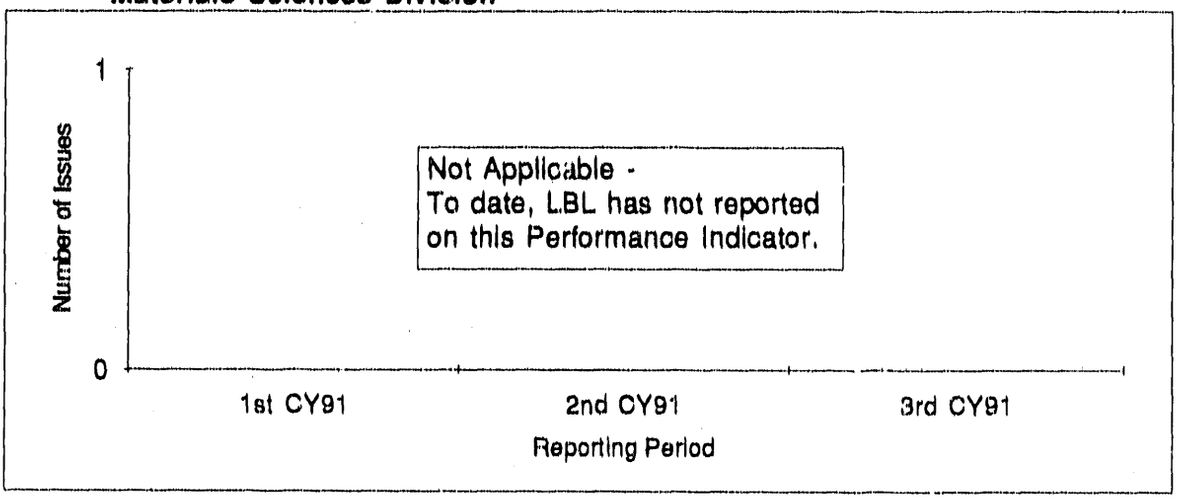
The total number of findings, including concerns and recommendations requiring corrective actions, by oversight assessments and line program self-assessments for which contractor corrective actions have not been completed at the time of the report.



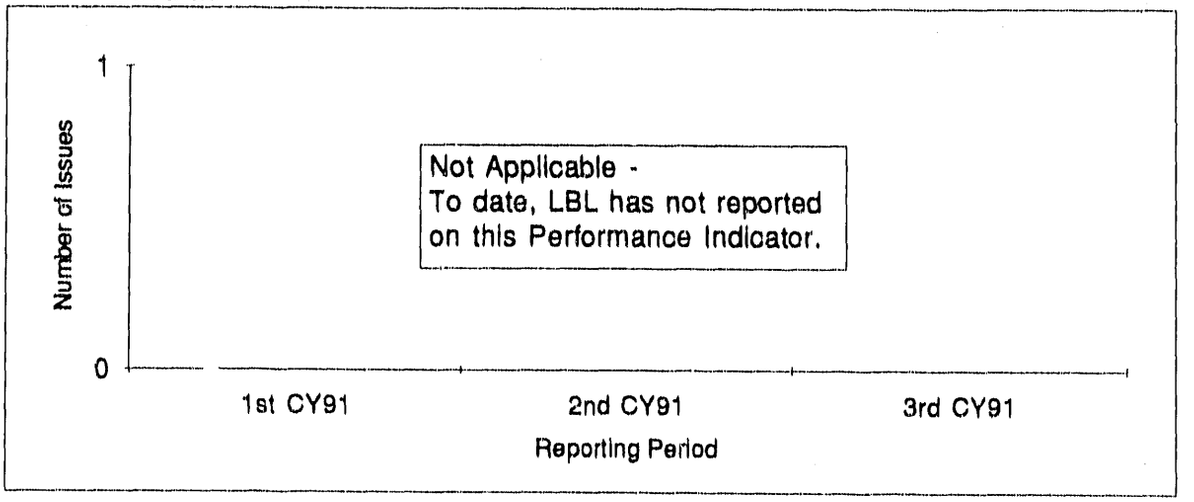


Current Period Data

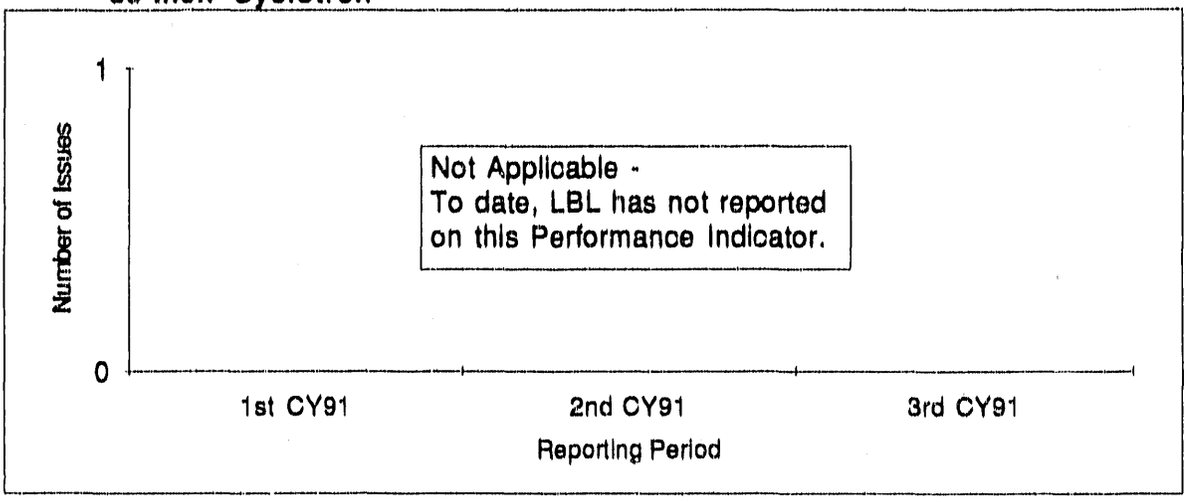
Materials Sciences Division



Bevalac

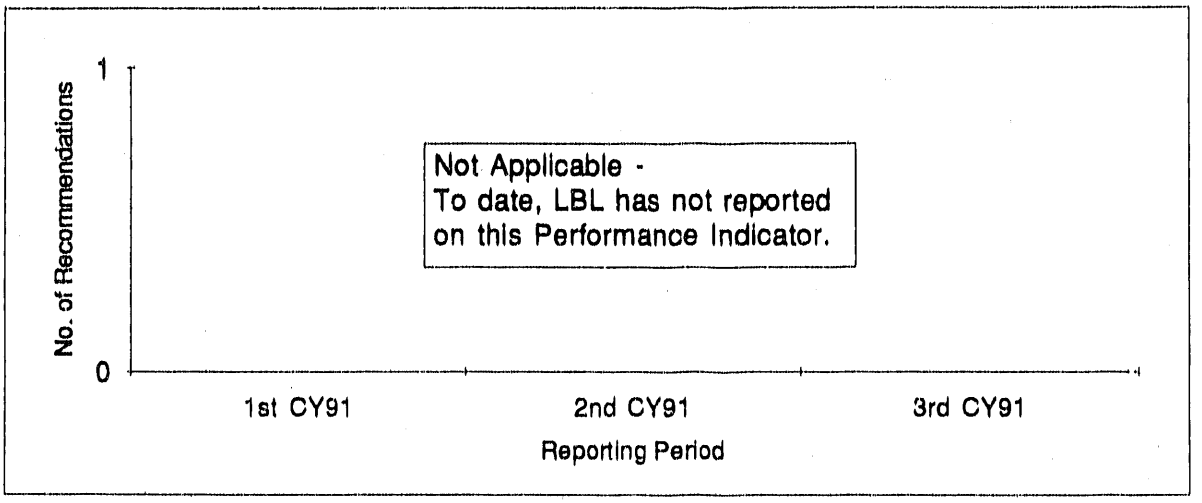


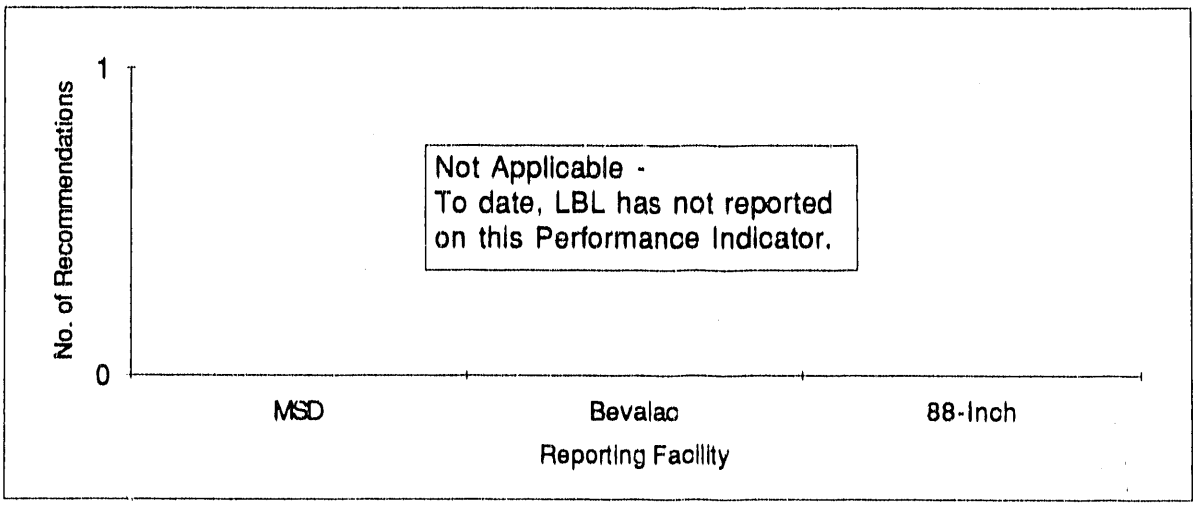
88-Inch Cyclotron



4.2 Open External Organization Recommendations

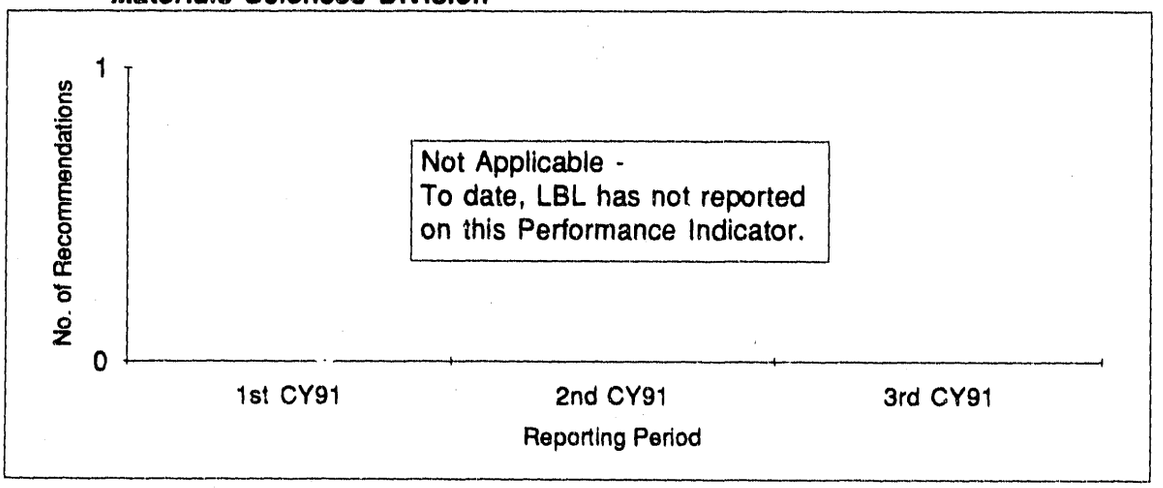
The total number of recommendations by external organizations, such as the Advisory Committee on Nuclear Facility Safety, the Defense Nuclear Facility Safety Board, the National Academy of Sciences, etc., directed to specific contractors or their facility operations, for which contractor corrective actions have not been completed at the time of the report.



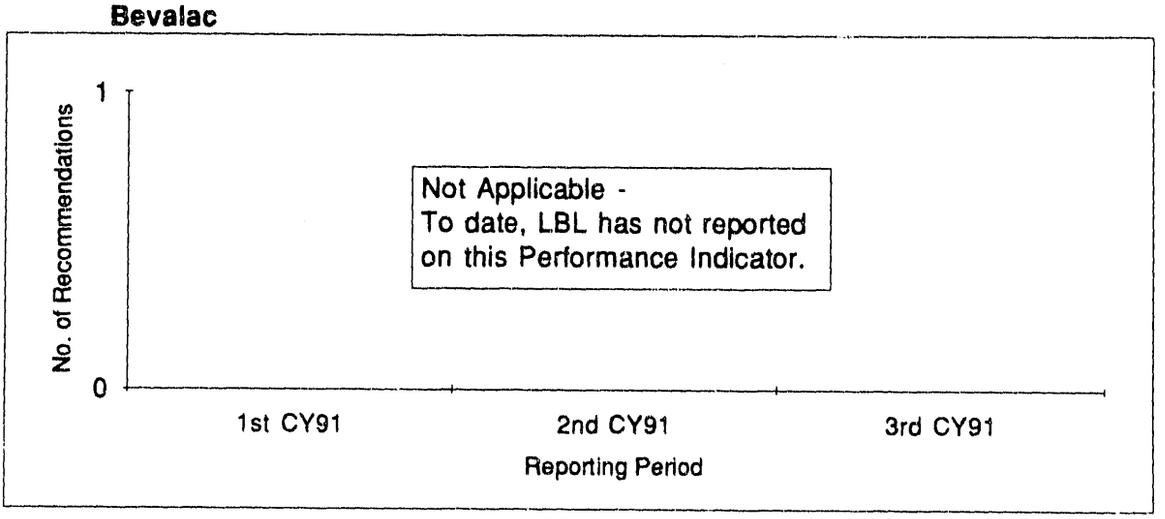


Current Period Data

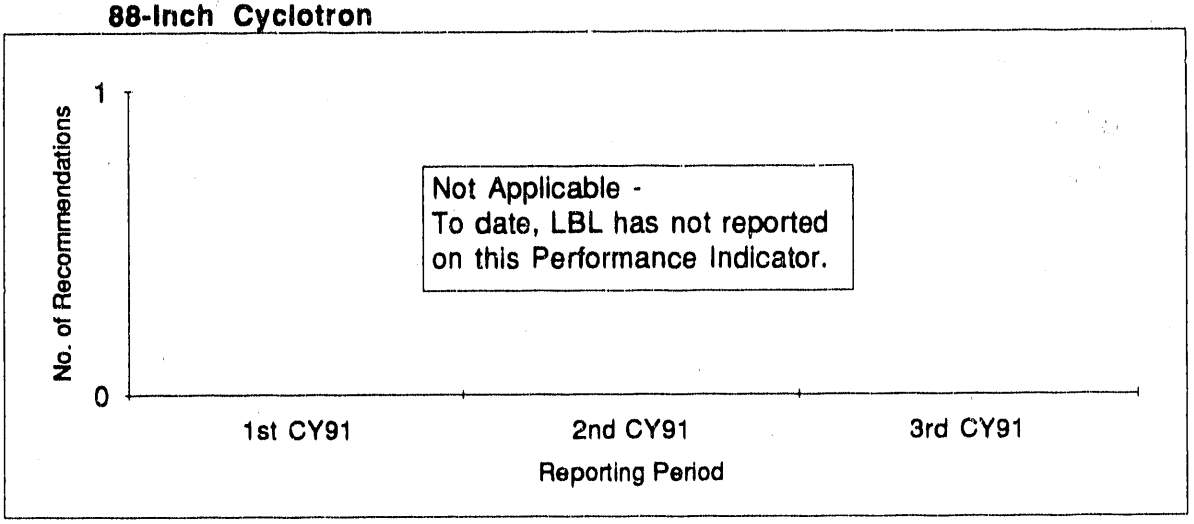
Materials Sciences Division



Bevalac

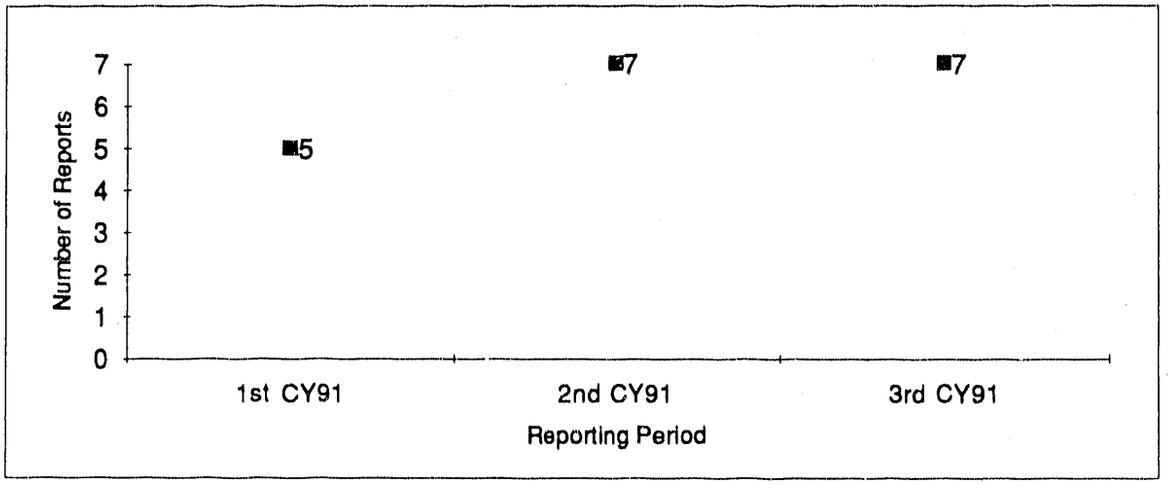


88-Inch Cyclotron

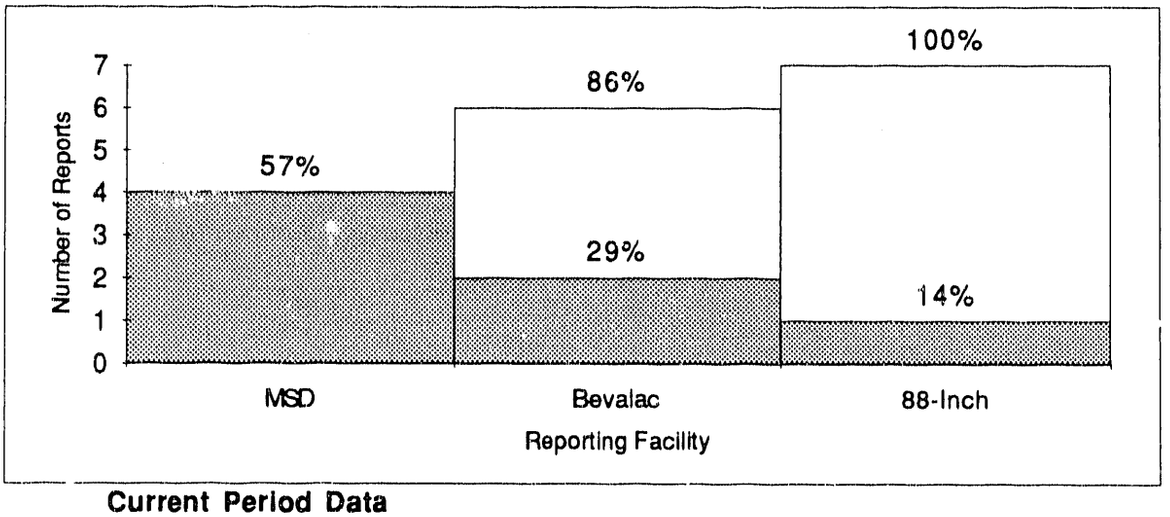


4.3 Occurrence Reports with Open Corrective Actions

The number of Final Occurrence Reports for which all corrective actions have not been completed at the time of the report.



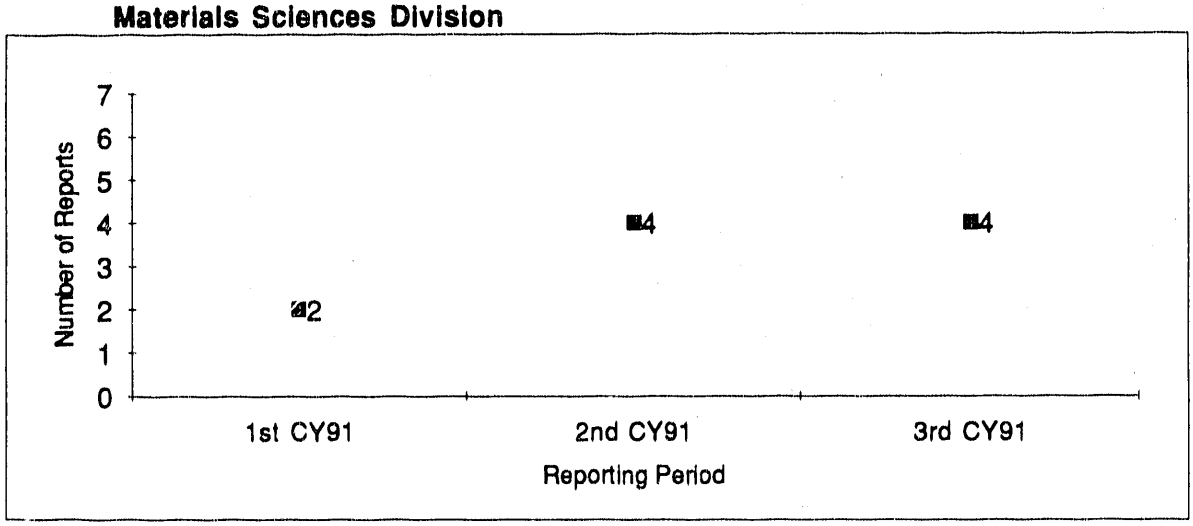
The above figures reflect corrections to the first and second quarter data which were reported on the errata sheets dated 11/27/91.



Current Period Data

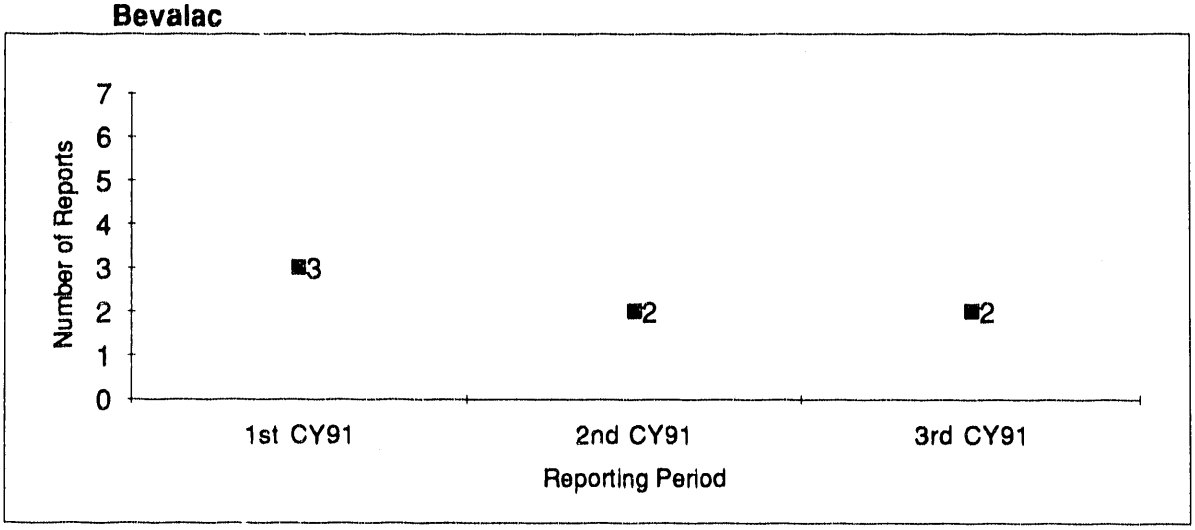
Although the Materials Sciences Division has the largest number of Occurrence reports with open corrective actions, we note that it also has the largest number of personnel (200 as opposed to 150 for the Bevalac and 22 for the 88" Cyclotron).

Materials Sciences Division

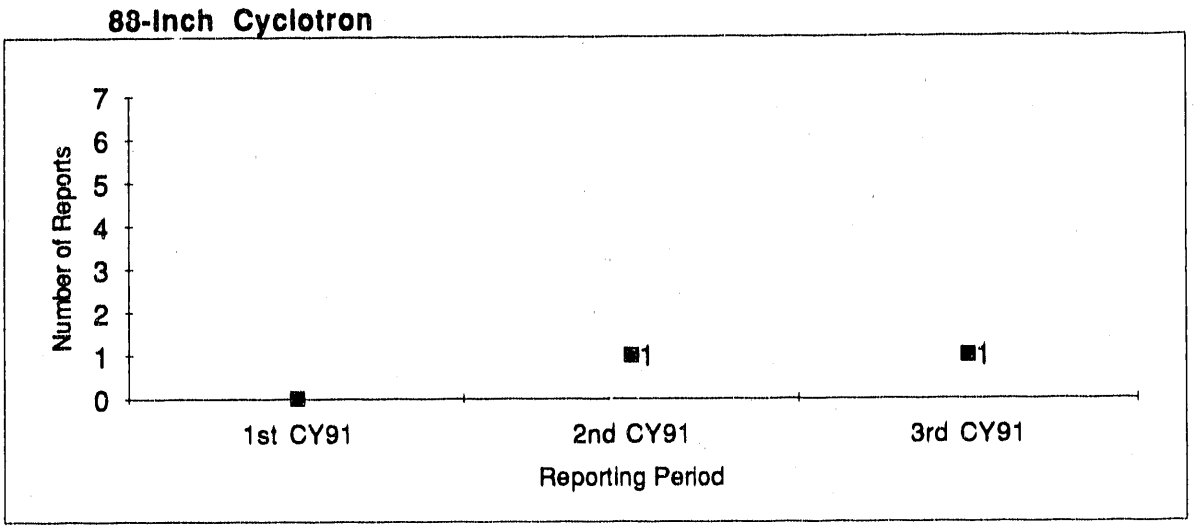


The first and second quarter data reflect corrections made on the errata sheets dated 11/27/91.

Bevalac



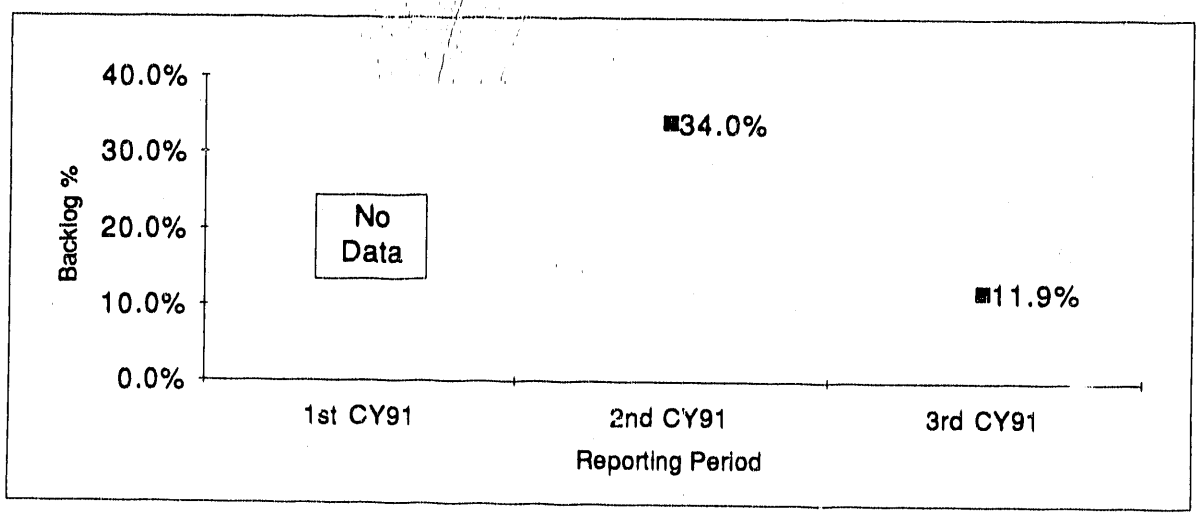
The first and second quarter data reflect corrections made on the errata sheets dated 11/27/91.



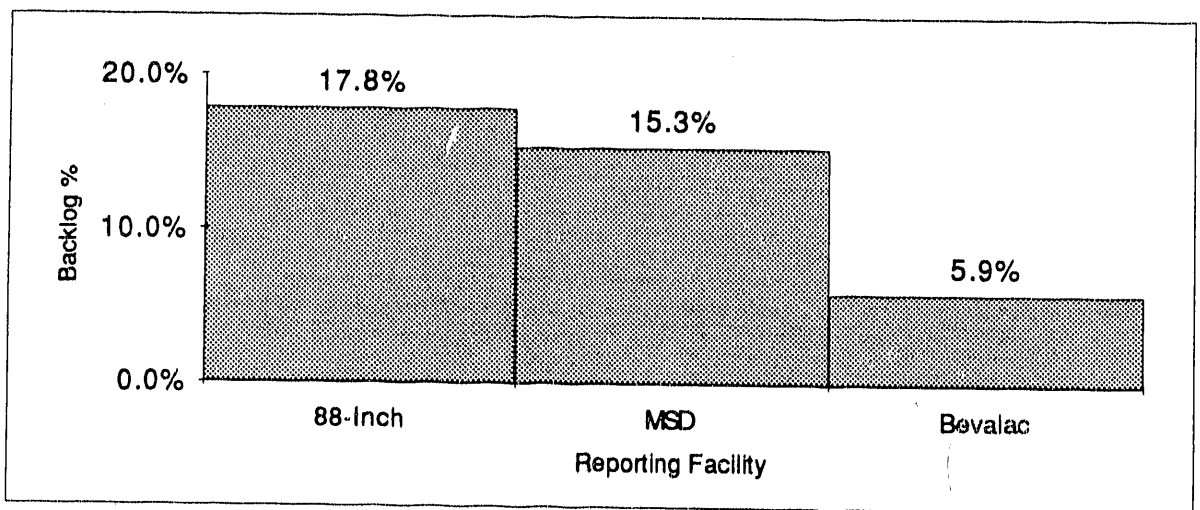
The second quarter data reflect corrections made on the errata sheets dated 11/27/91.

4.4 Corrective Maintenance Backlog

The percentage of open corrective maintenance work requests, including those requiring facility or process shutdown, that are greater than three months old at the end of the reporting period. Corrective maintenance may include minor modifications if performed under a corrective maintenance work request.

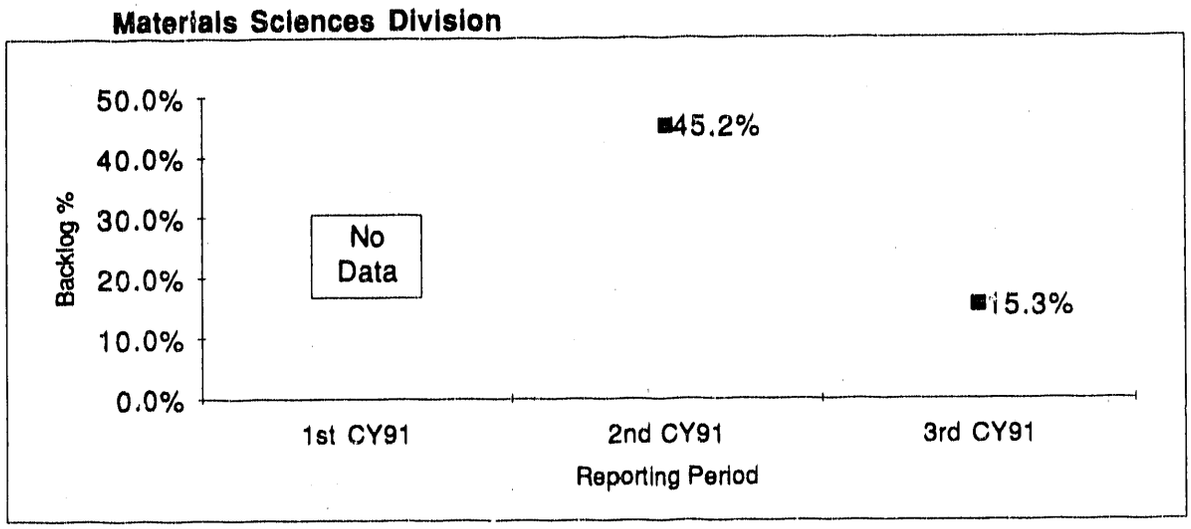


The corrective maintenance backlog has improved over the past quarter.

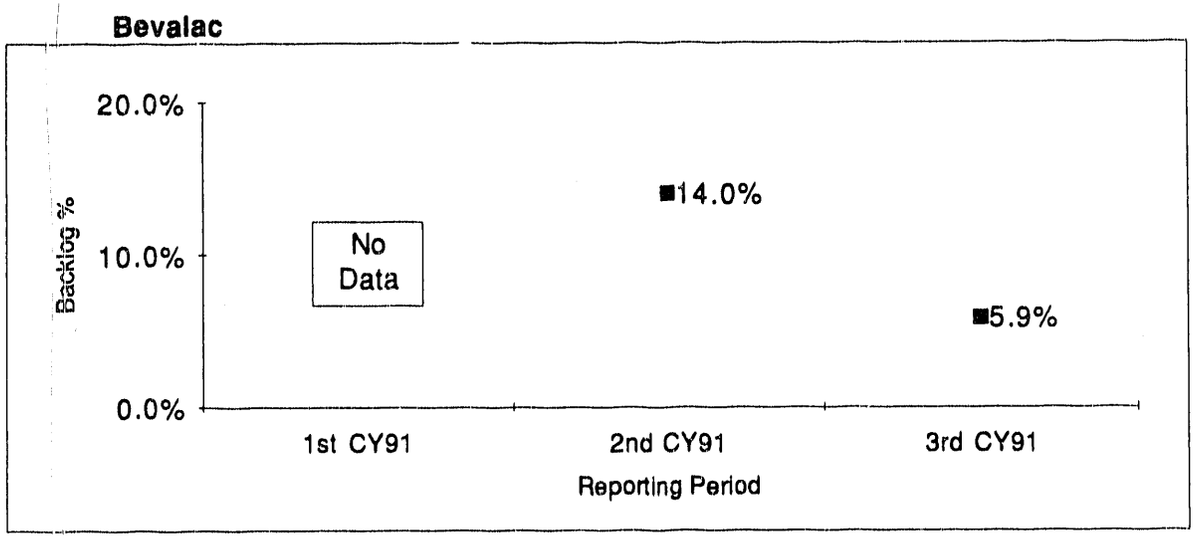


Current Period Data

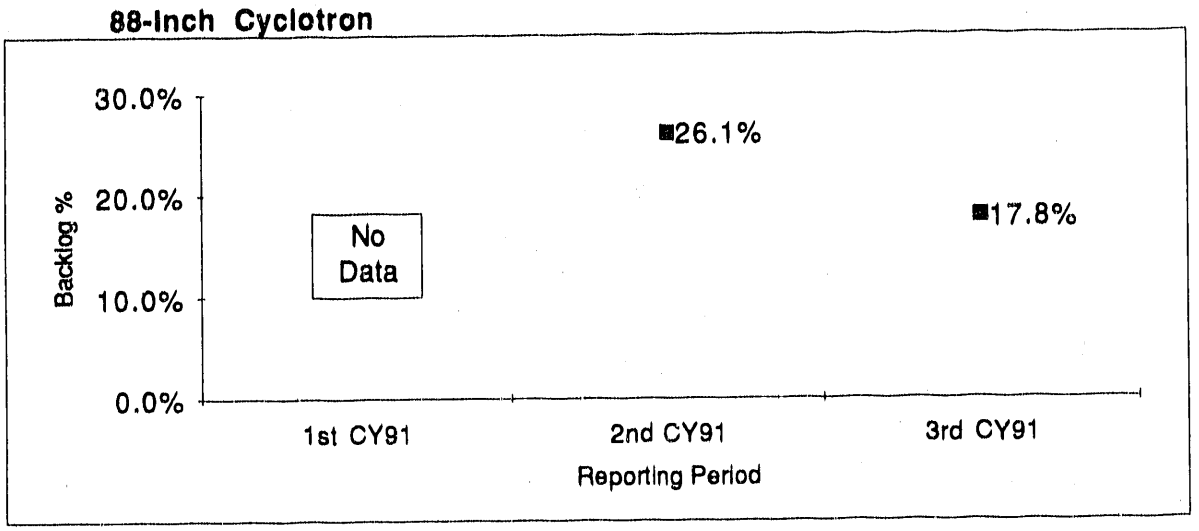
Note: Because the sum of the facility rates does not accurately reflect the overall LBL rate, the individual facility rates are given here.



The corrective maintenance backlog was significantly reduced in the current reporting period from the second quarter high.



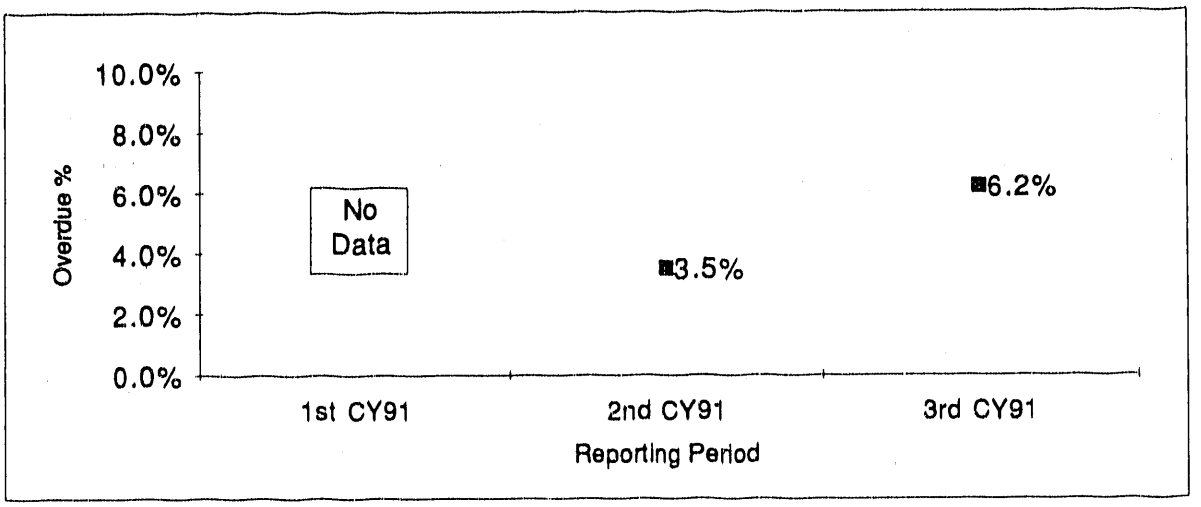
The corrective maintenance backlog was reduced in the current reporting period from the second quarter high.



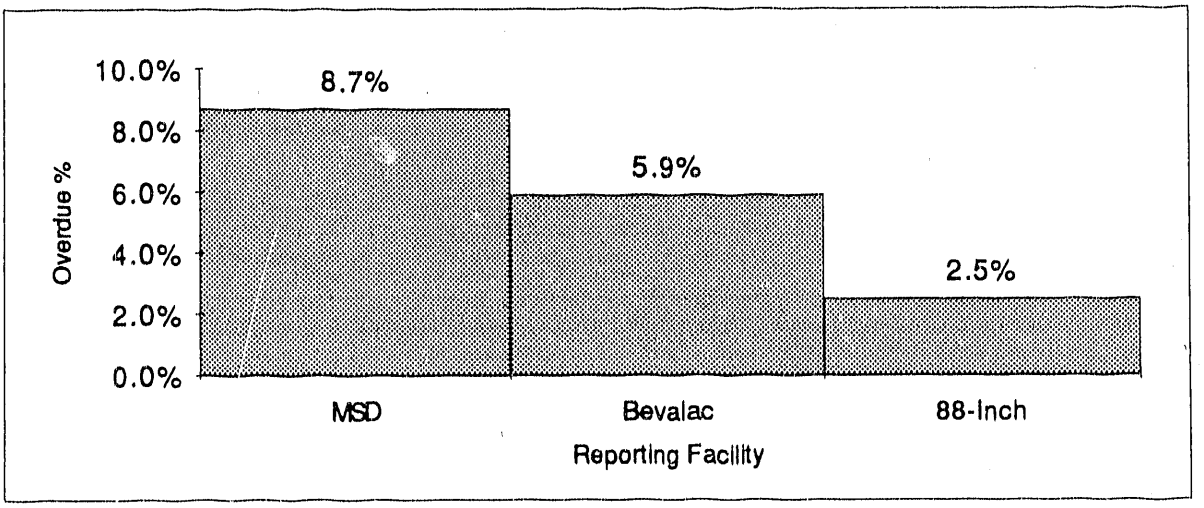
A decrease in the corrective maintenance backlog was evident during the third quarter.

4.5 Preventive Maintenance Overdue

The percentage of preventive maintenance items that were not completed within the originally scheduled interval.



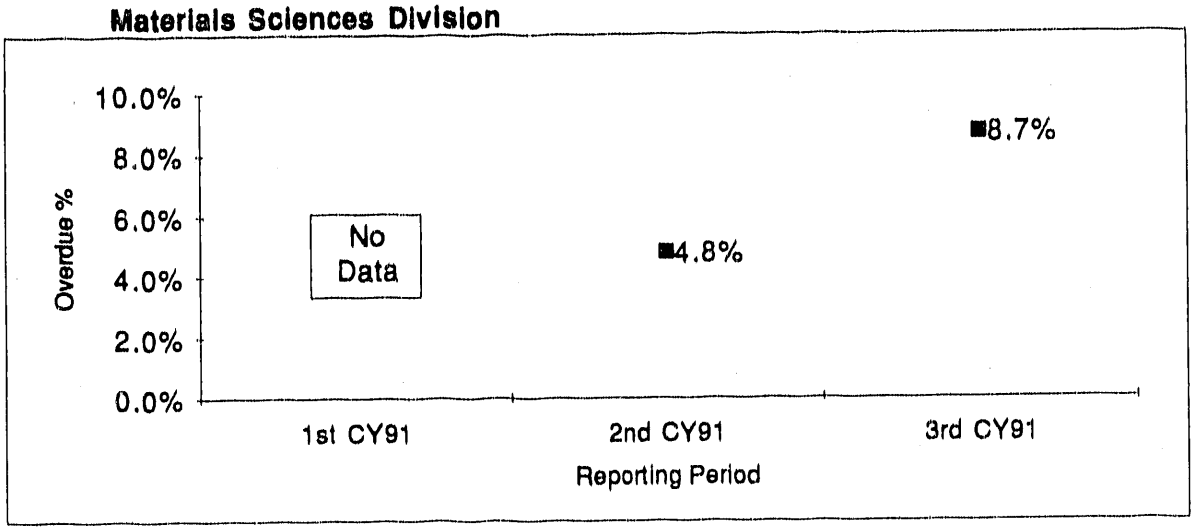
Overdue preventive maintenance has increased since the last quarter.



Current Period Data

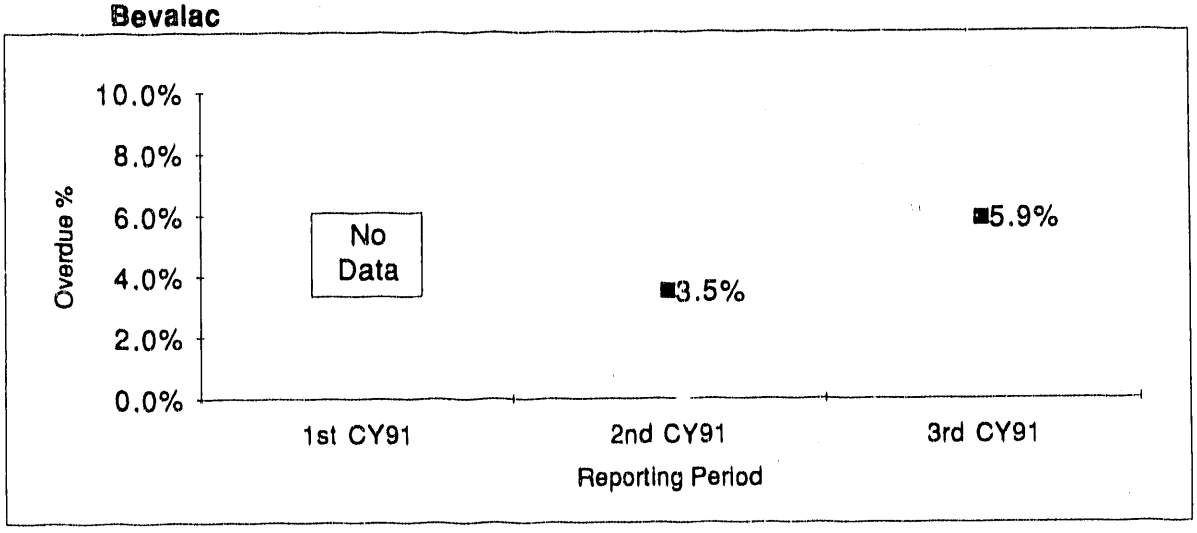
Note: Because the sum of the facility rates does not accurately reflect the overall LBL rate, the individual facility rates are given here.

Materials Sciences Division

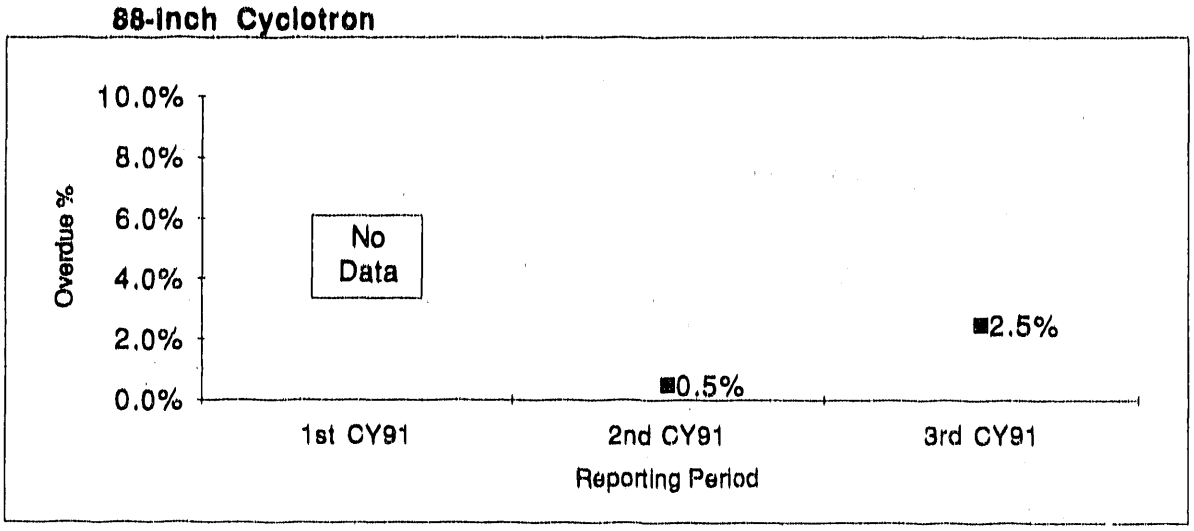


Overdue preventive maintenance is up since the last quarter.

Bevalac



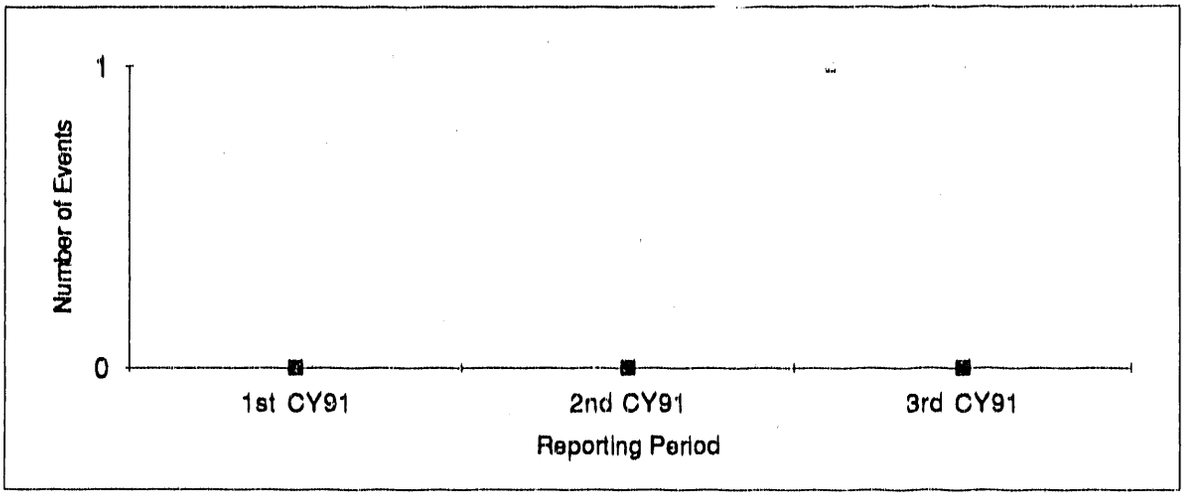
Overdue preventive maintenance is up since the last quarter.



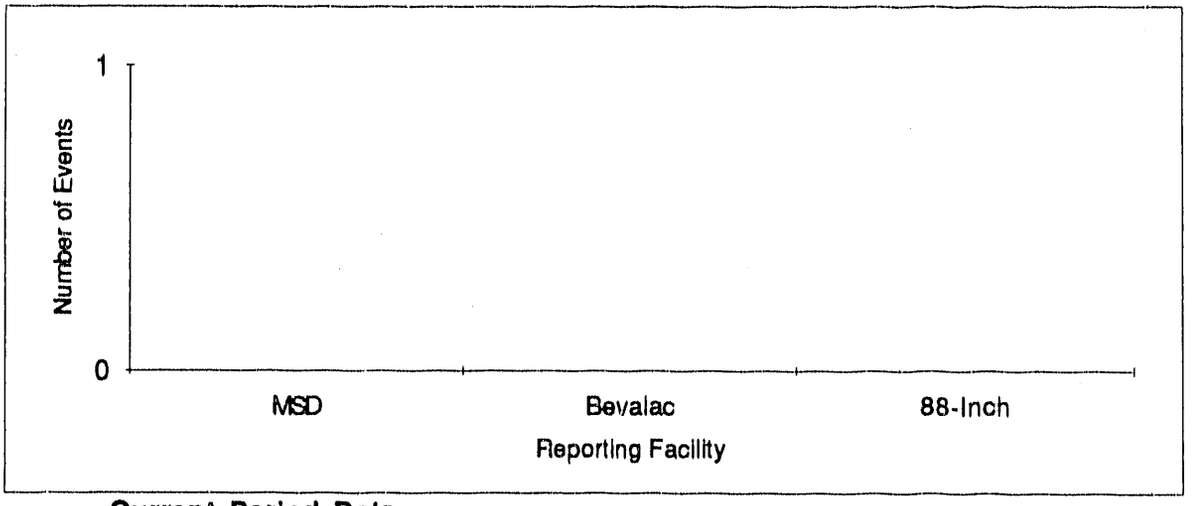
Overdue preventive maintenance is up since the last quarter.

4.6 Substance Abuse Incidents

The number of reportable occurrences involving personnel use, possession or involvement of/with controlled substances, e.g., drugs, alcohol, etc.



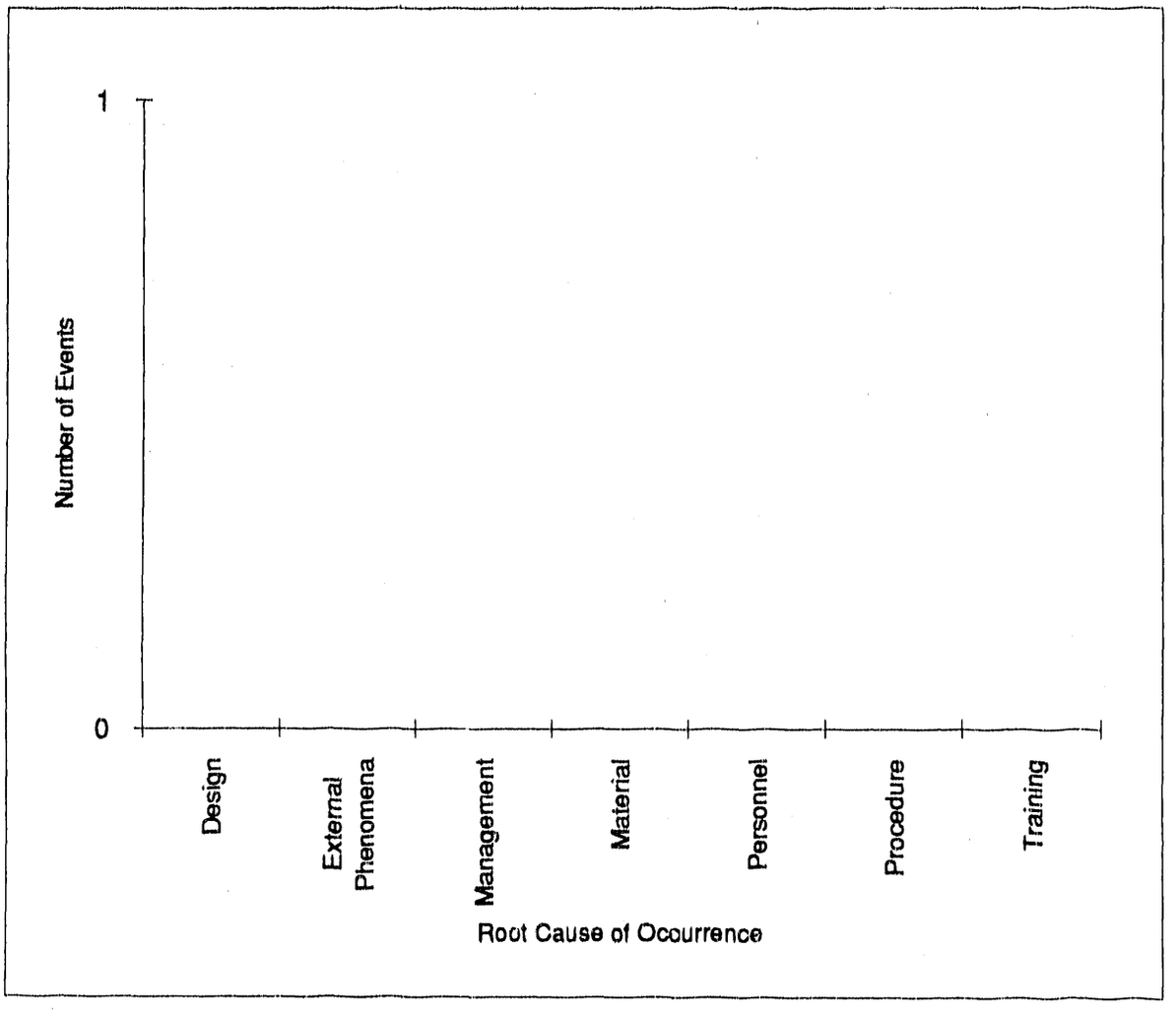
There have been no substance abuse incidents at LBL to date.



Current Period Data

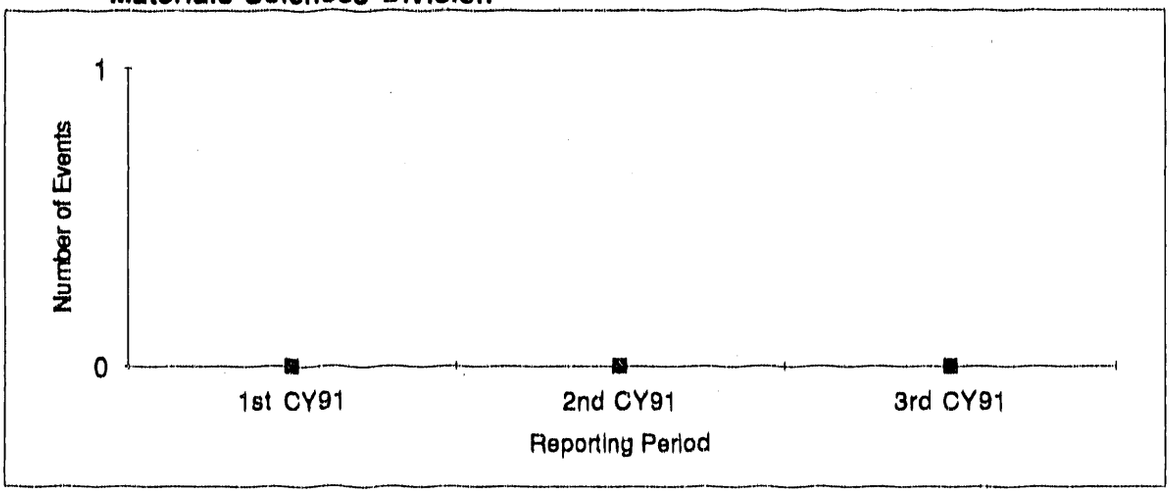
There were no substance abuse incidents at LBL during the current reporting period.

Root Cause of Occurrences



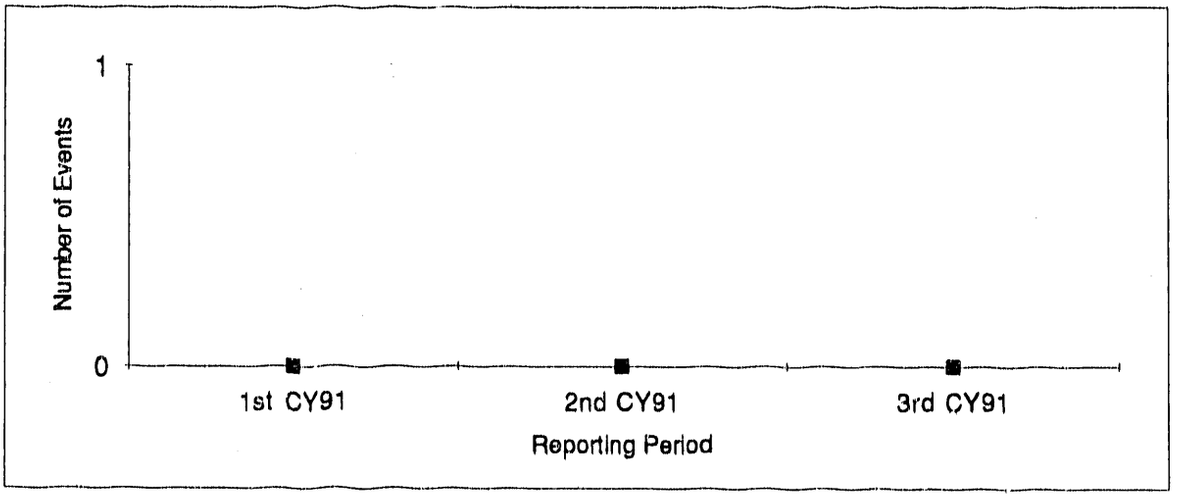
There have been no substance abuse incidents at LBL to date.

Materials Sciences Division

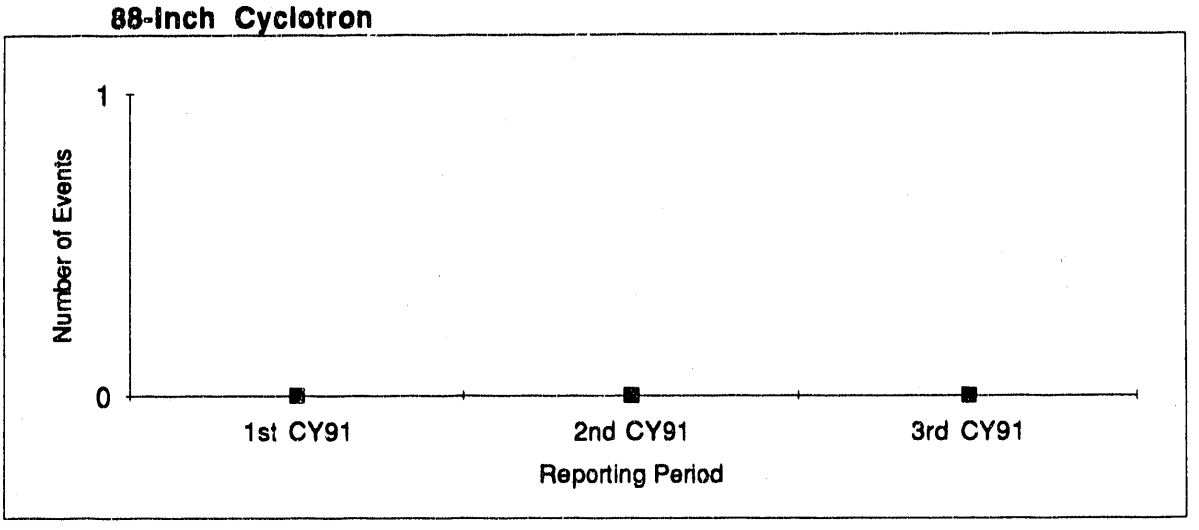


No substance abuse incidents to date.

Bevalac



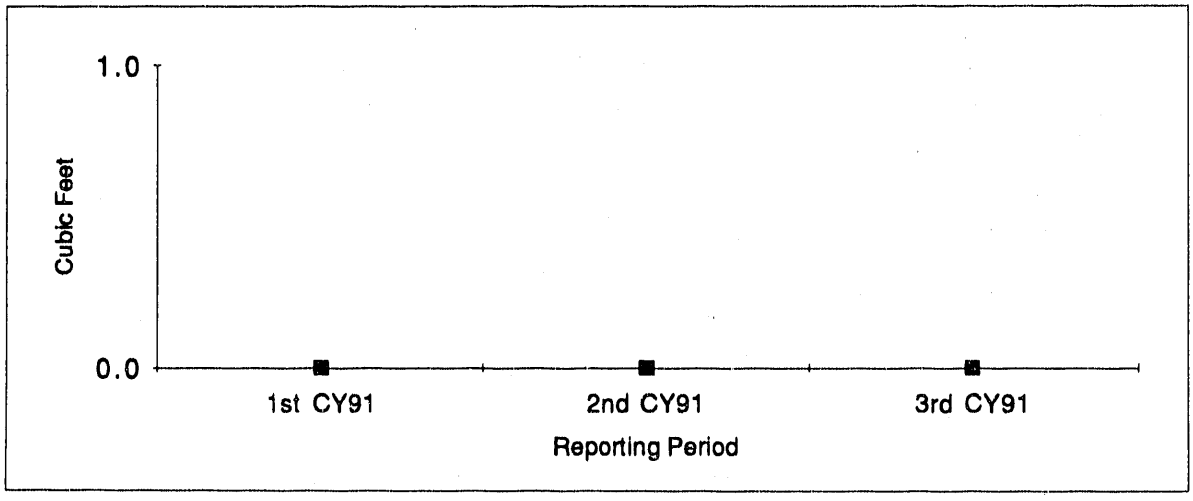
No substance abuse incidents to date.



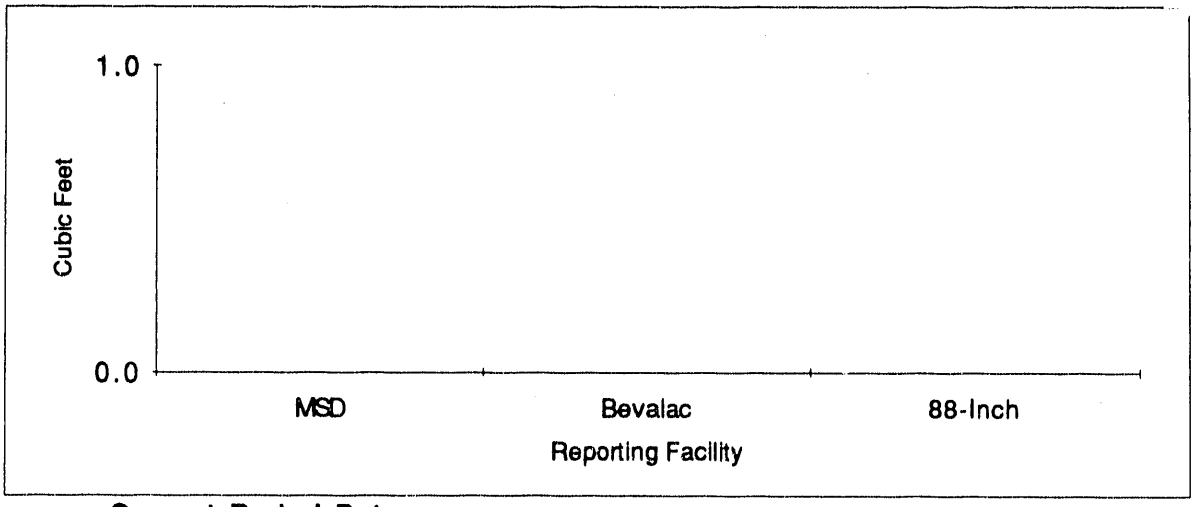
No substance abuse incidents to date.

4.7.1.1 Solid Low Level Radioactive Waste - Generated

The total volume, in cubic feet, of solid low level radioactive waste generated during the reporting period.



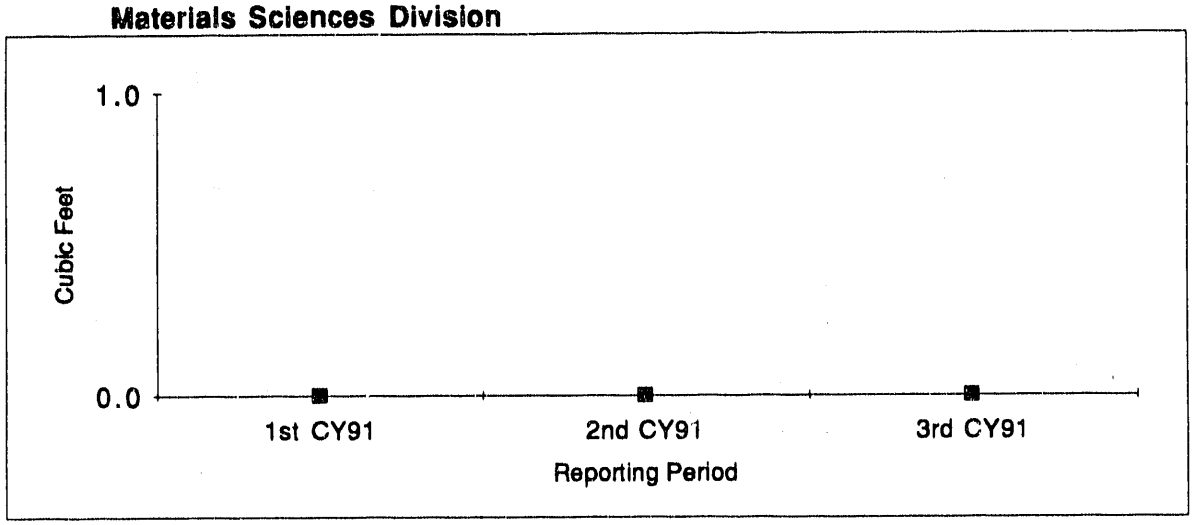
There has not been any low level radioactive waste has been generated at LBL to date.



Current Period Data

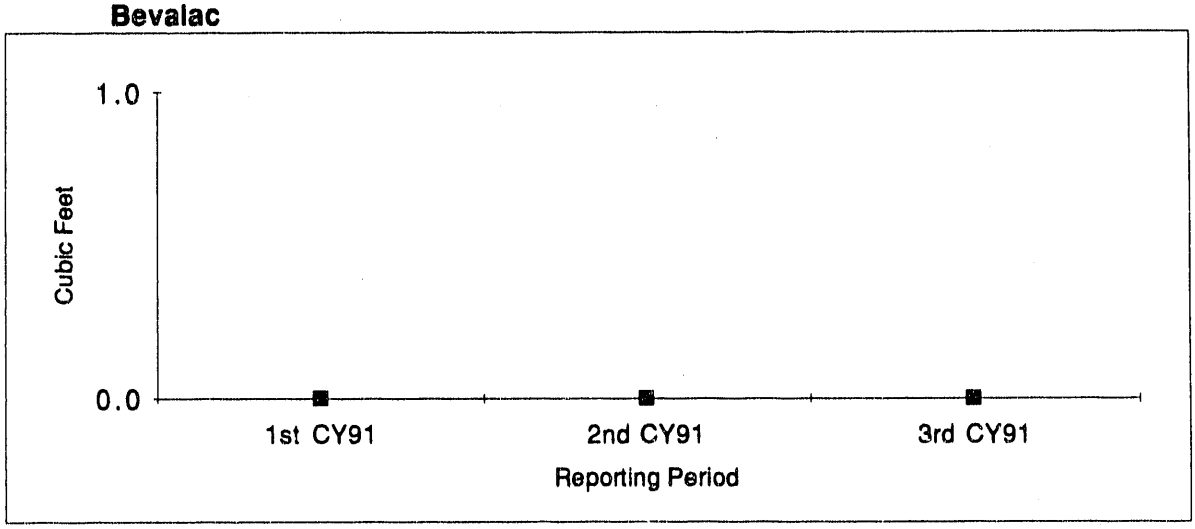
There was no low level radioactive waste generated at LBL during the current reporting period.

Materials Sciences Division

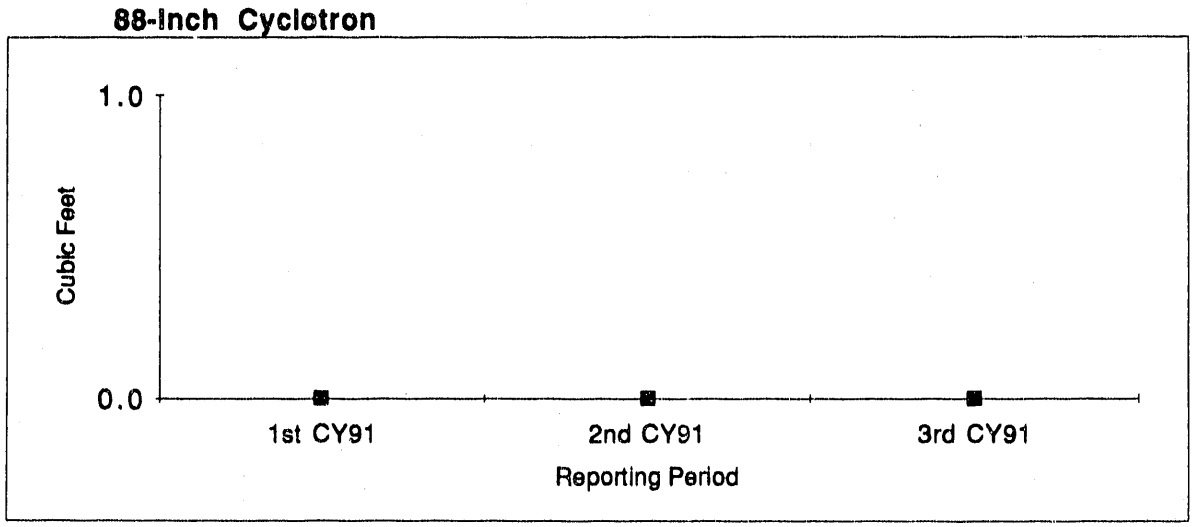


No low level radioactive waste generated to date.

Bevalac



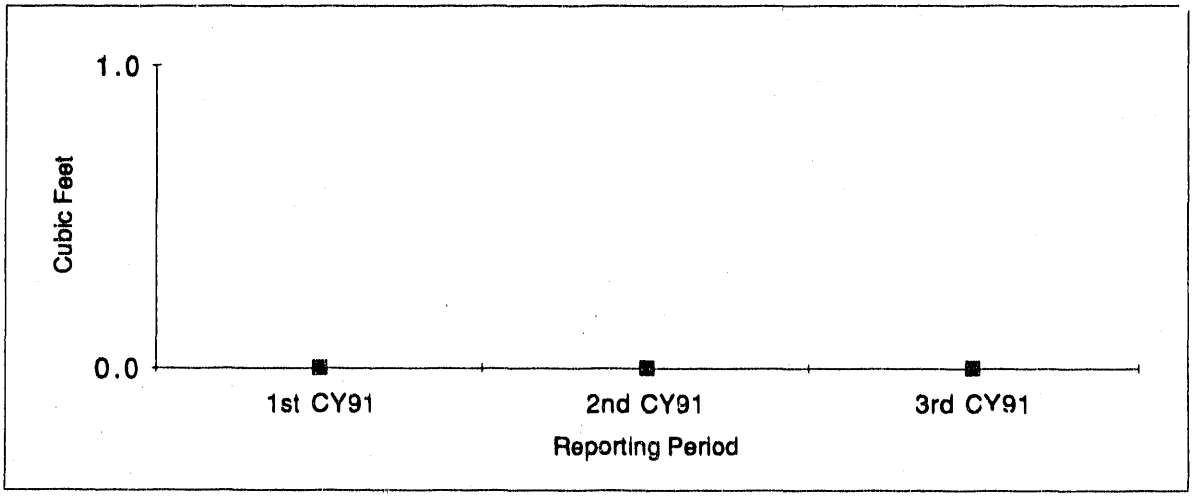
No low level radioactive waste generated to date.



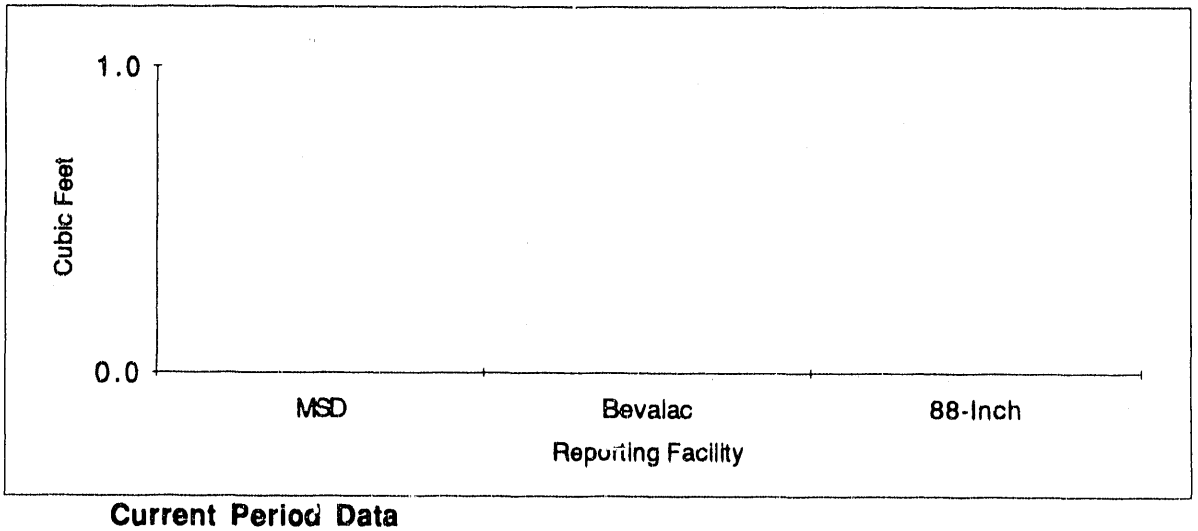
No low level radioactive waste generated to date.

4.7.1.2 Solid Low Level Radioactive Waste - Ready to Ship

The total volume, in cubic feet, of the final form (pending shipment) of solid low level radioactive waste generated during the reporting period.



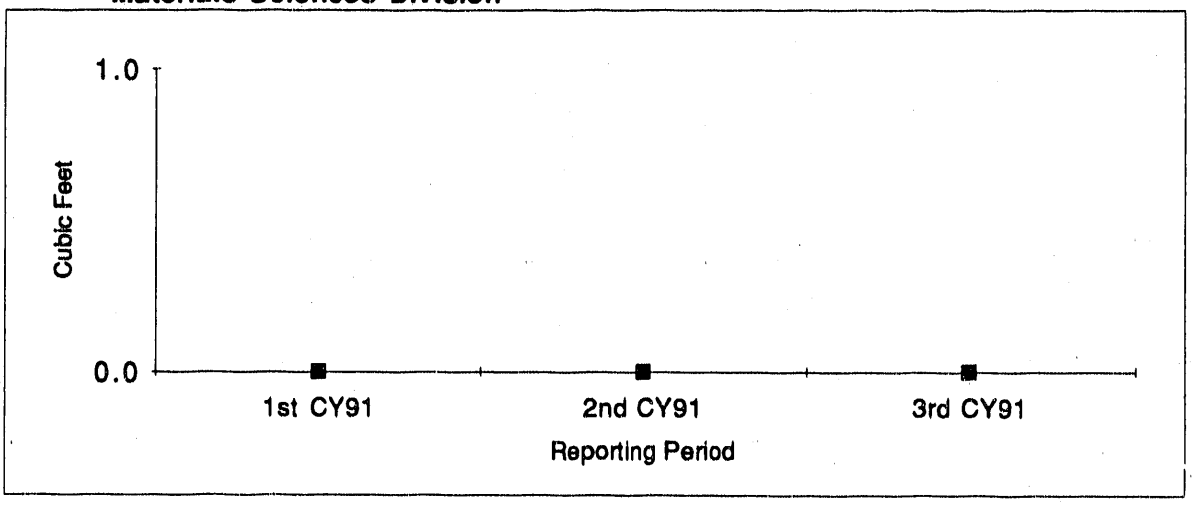
There has not been any low level radioactive waste has been generated at LBL to date.



Current Period Data

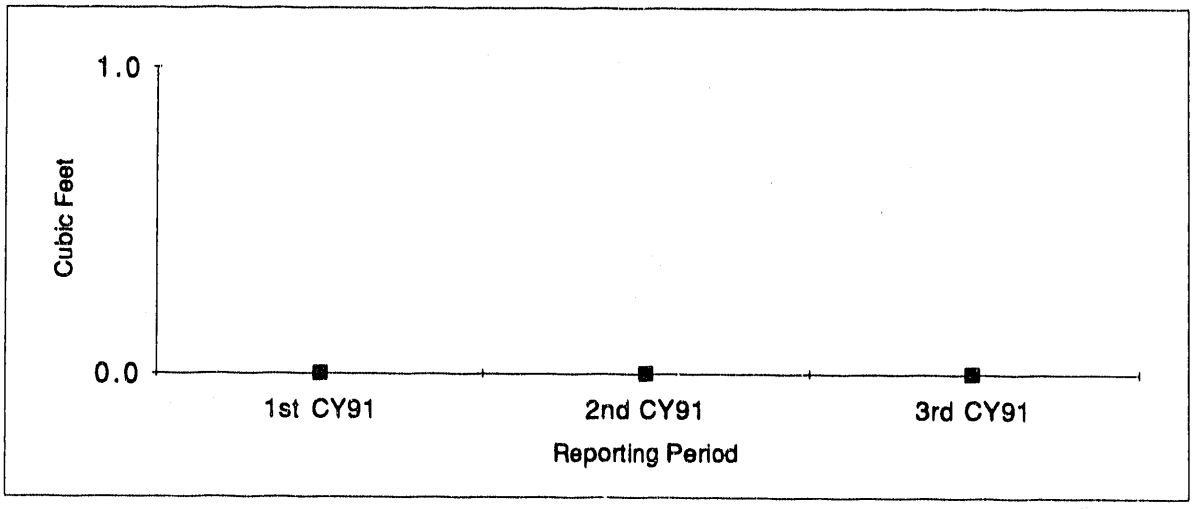
There was no low level radioactive waste generated at LBL during the current reporting period.

Materials Sciences Division



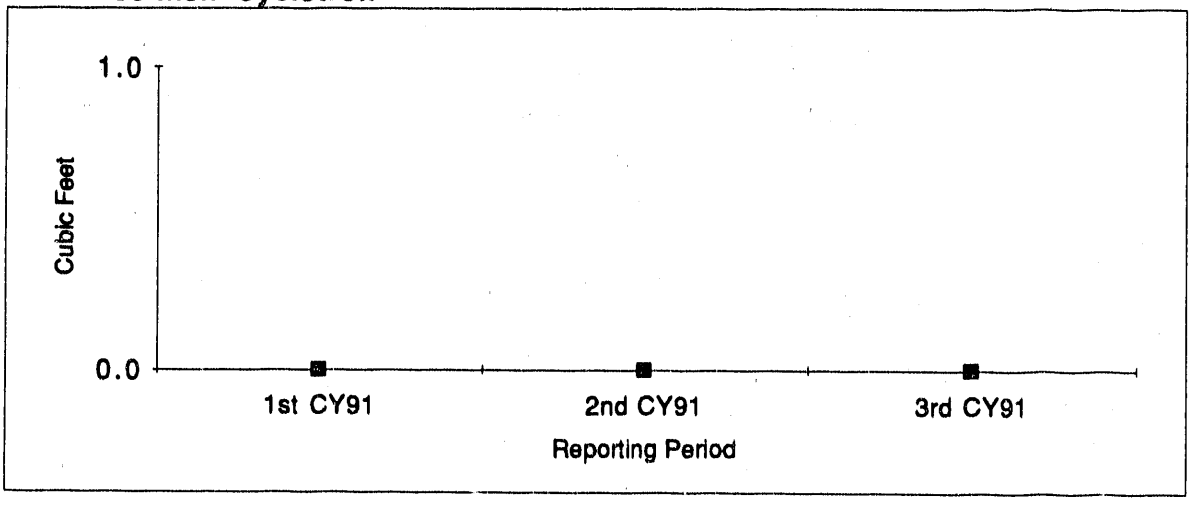
No low level radioactive waste generated to date.

Bevalac



No low level radioactive waste generated to date.

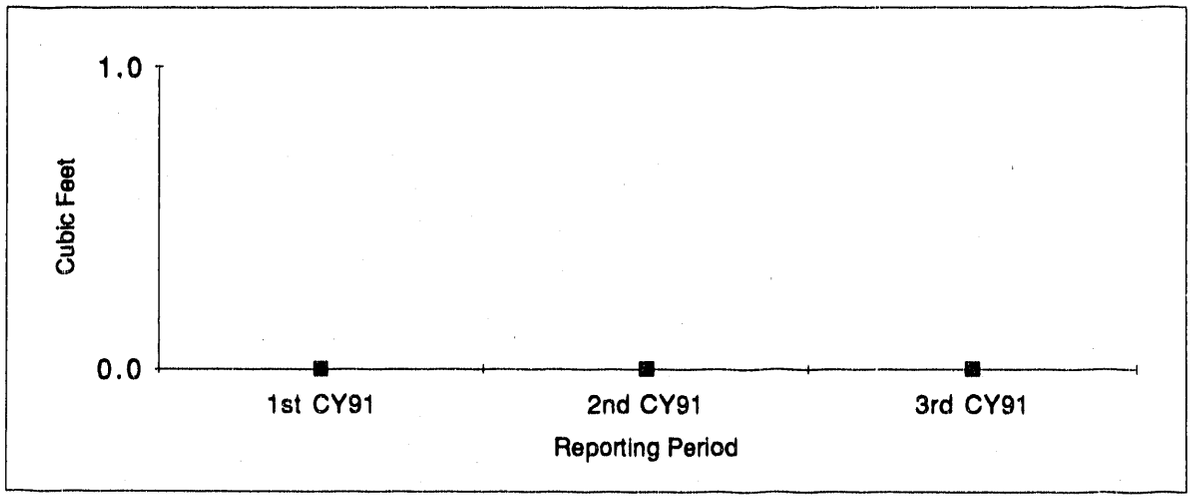
88-Inch Cyclotron



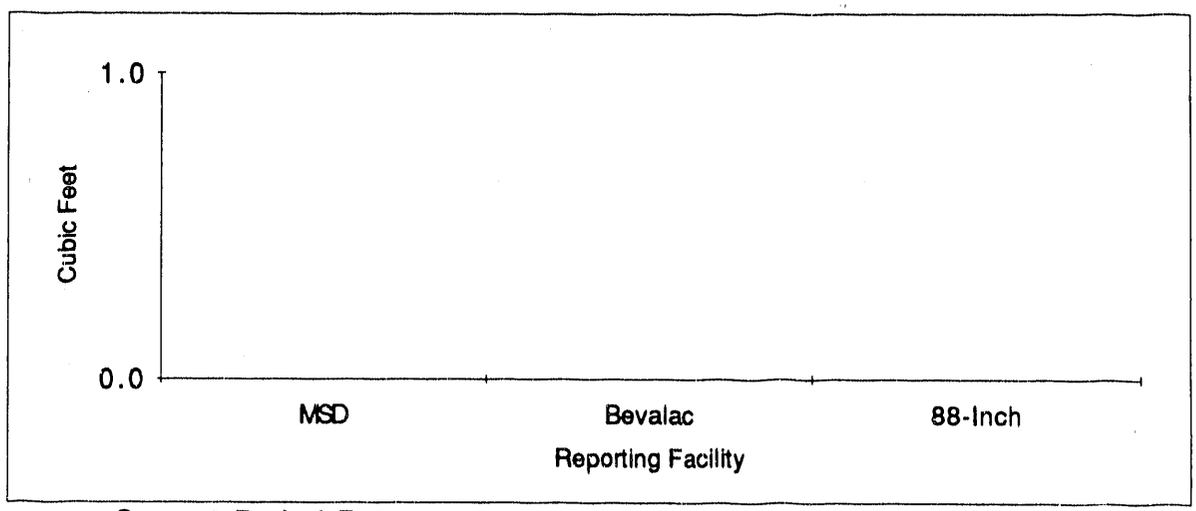
No low level radioactive waste generated to date.

4.7.1.3 Solid Low Level Radioactive Waste - Shipped

The total volume, in cubic feet, of solid low level radioactive waste shipped during the reporting period.



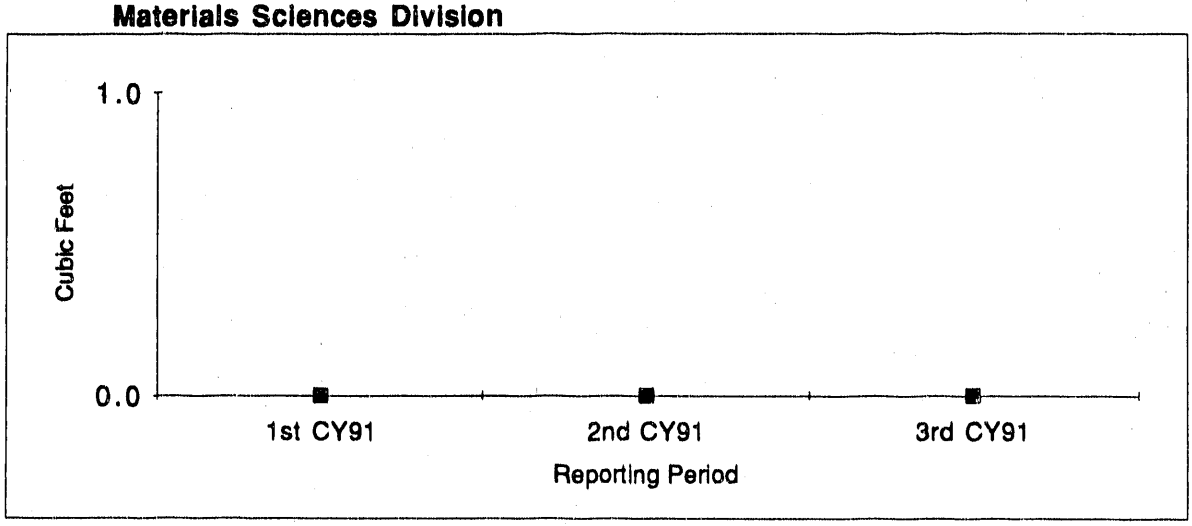
There has not been any low level radioactive waste has been generated at LBL to date.



Current Period Data

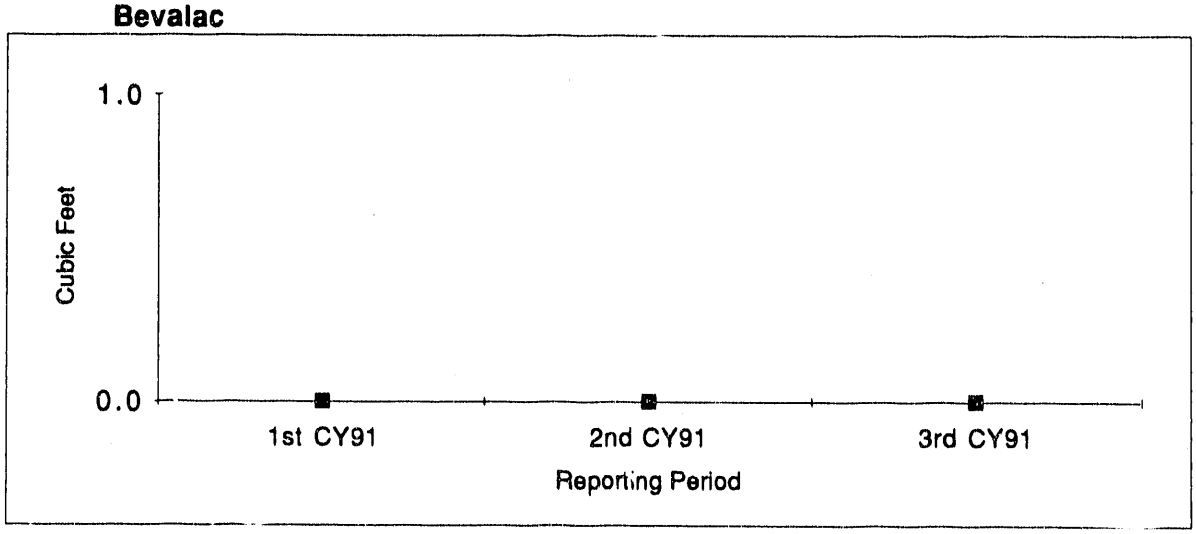
There was no low level radioactive waste generated at LBL during the current reporting period.

Materials Sciences Division

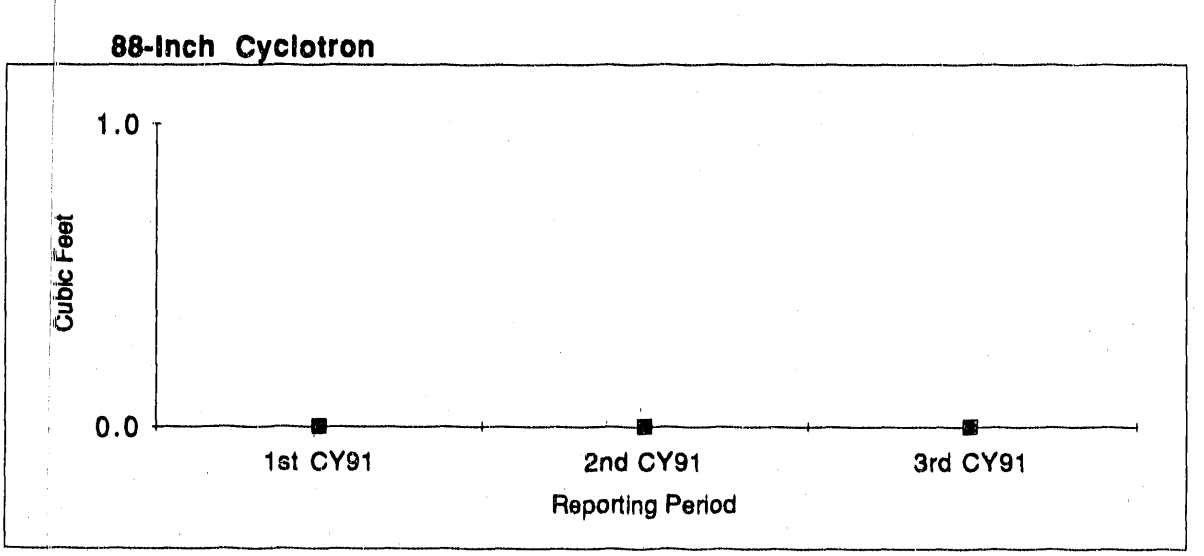


No low level radioactive waste generated to date.

Bevalac



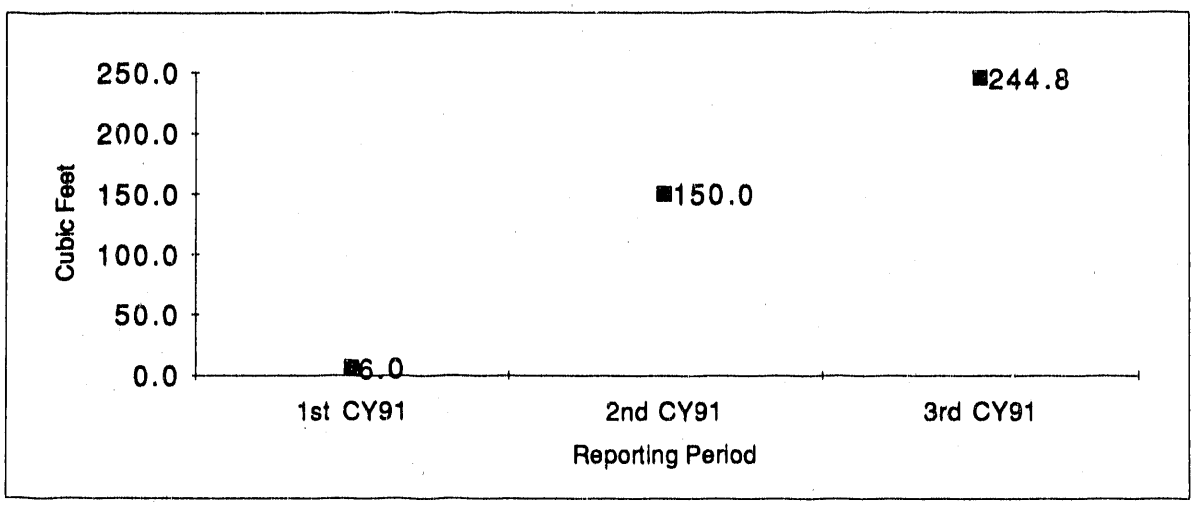
No low level radioactive waste generated to date.



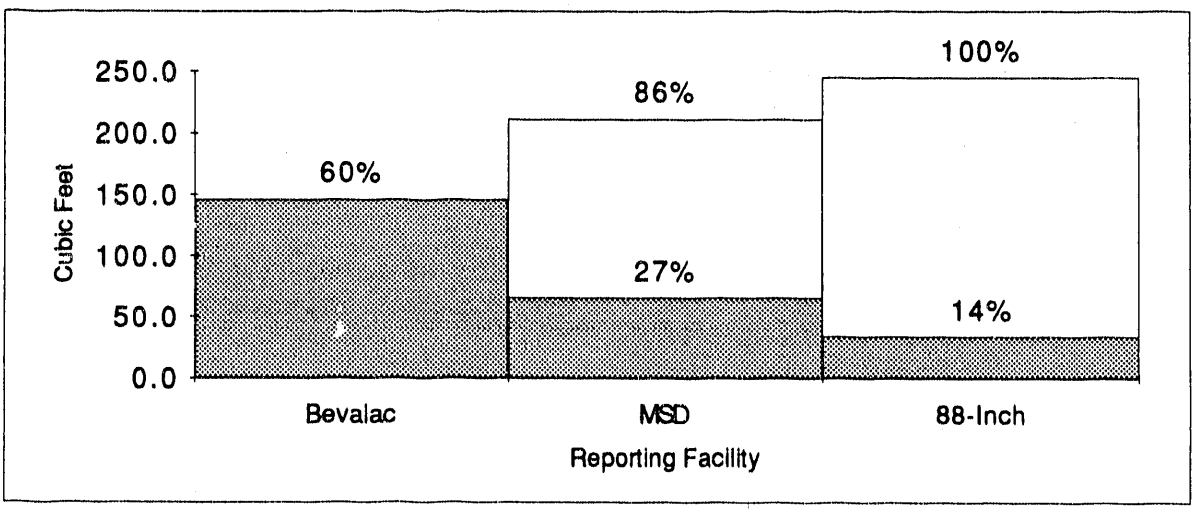
No low level radioactive waste generated to date.

4.7.2.1 Solid Low Level Hazardous Waste - Generated

The total volume, in cubic feet, of solid low level hazardous waste generated during the reporting period.

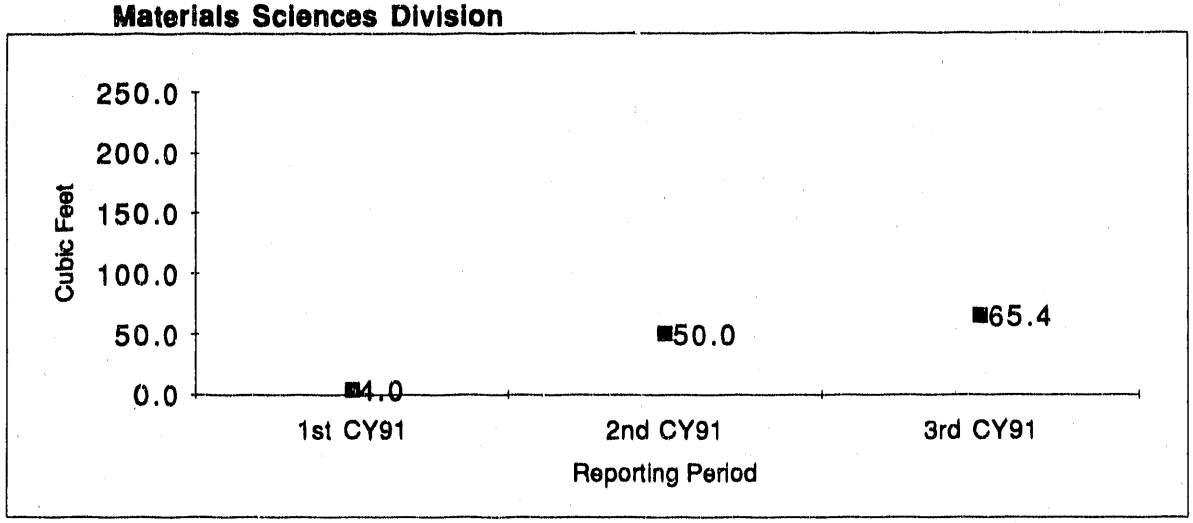


The amount of low-level hazardous waste generated has been increasing steadily over the past three quarters.



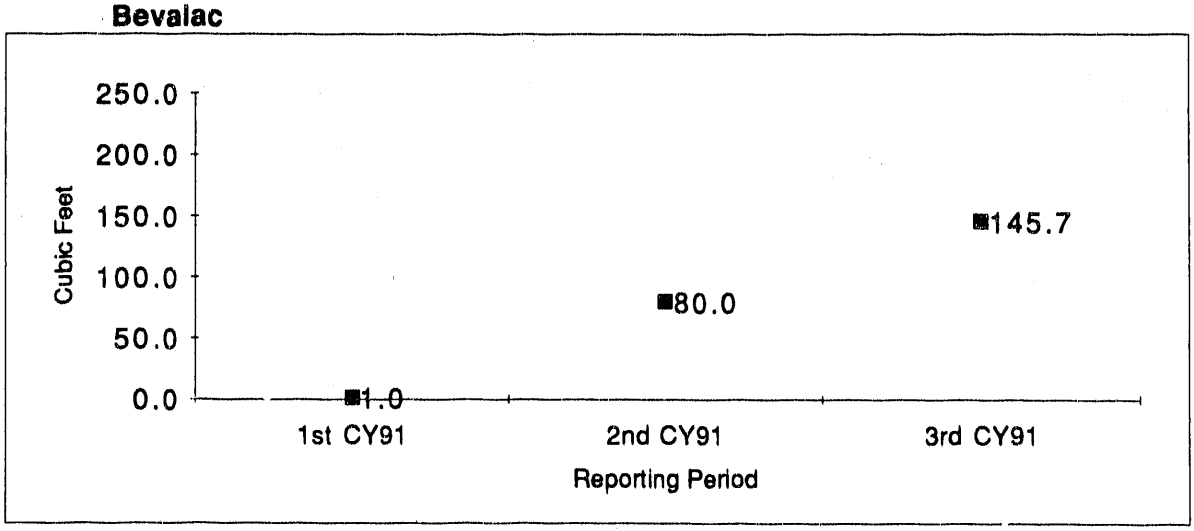
Current Period Data

Materials Sciences Division

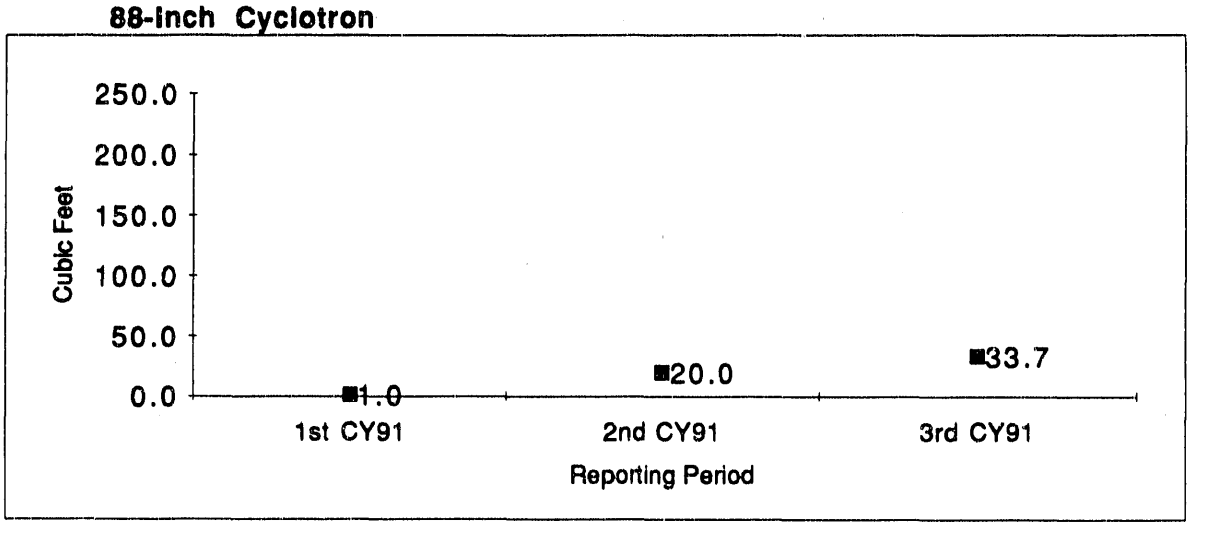


Solid low level hazardous waste generation has increased during the year.

Bevalac



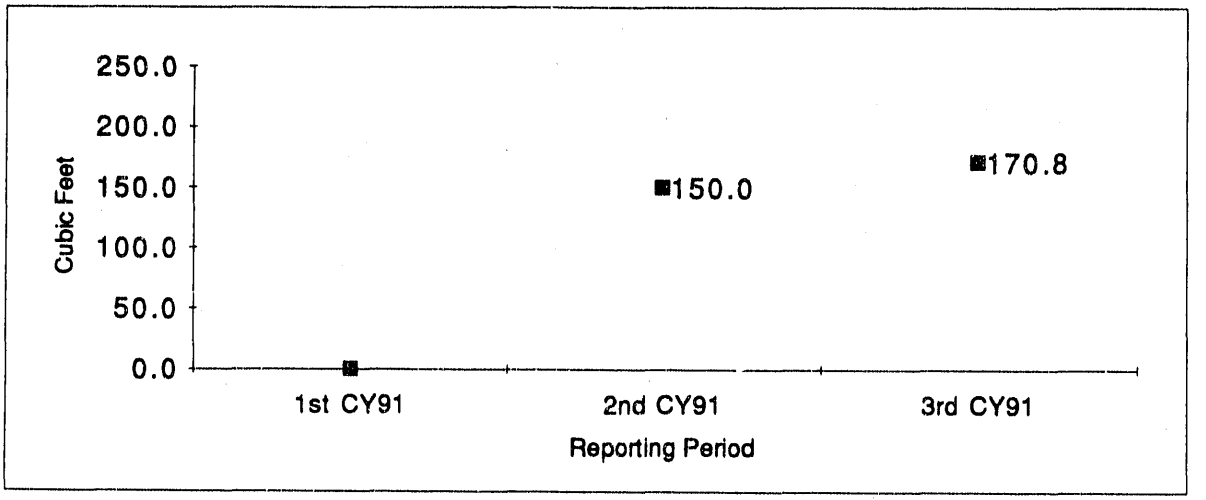
An increase in low level hazardous waste has been reported.



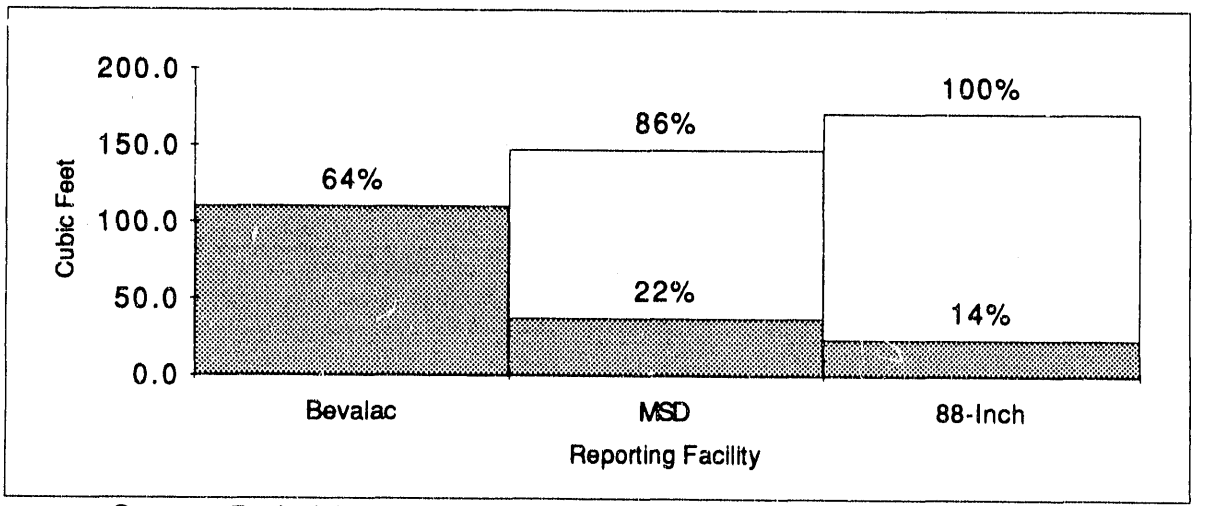
An increase in low level hazardous waste has been reported.

4.7.2.2 Solid Low Level Hazardous Waste - Ready to Ship

The total volume, in cubic feet, of the final form (pending shipment) of low level hazardous waste generated during the reporting period.

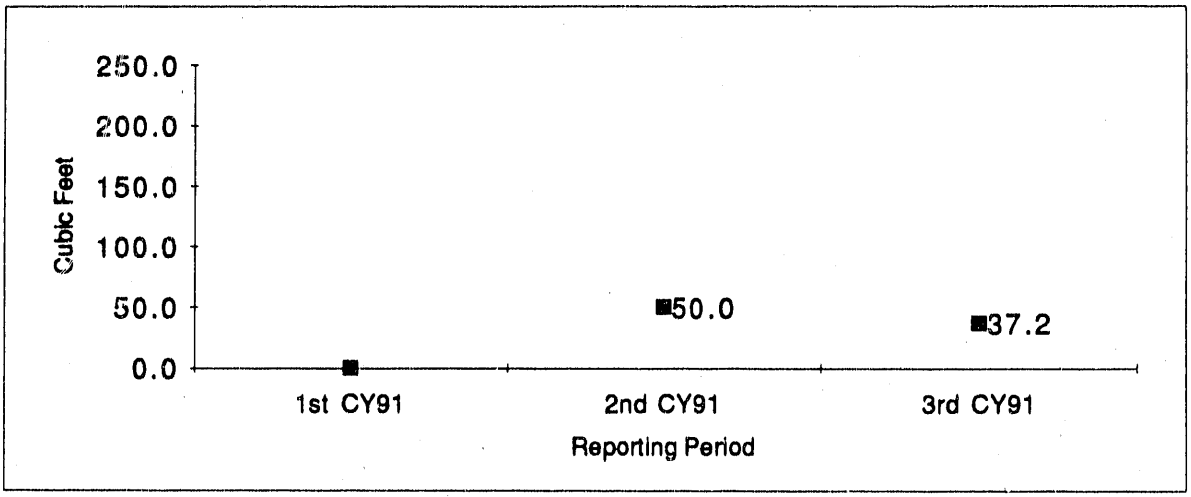


The amount of low-level hazardous waste prepared for shipment was up slightly over the second quarter.



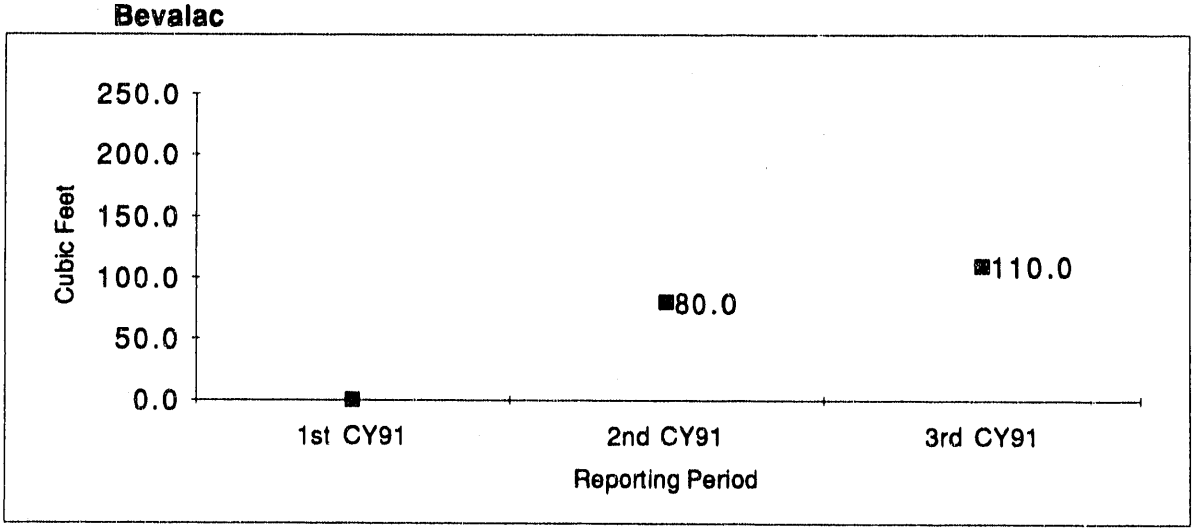
Current Period Data

Materials Sciences Division

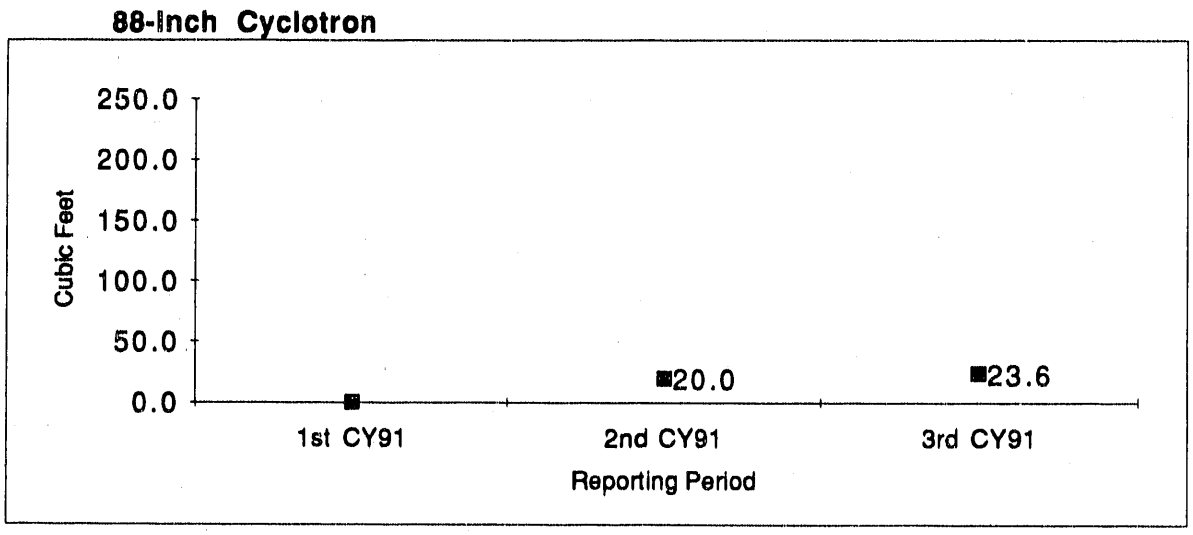


No trend noted.

Bevalac



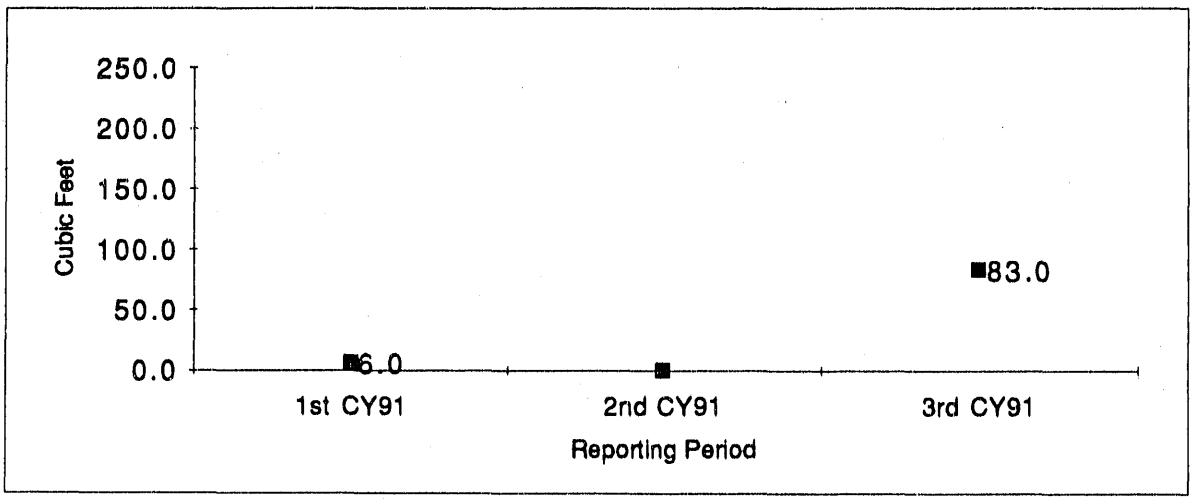
Quantity of low level hazardous waste ready to ship has steadily increased since the first quarter.



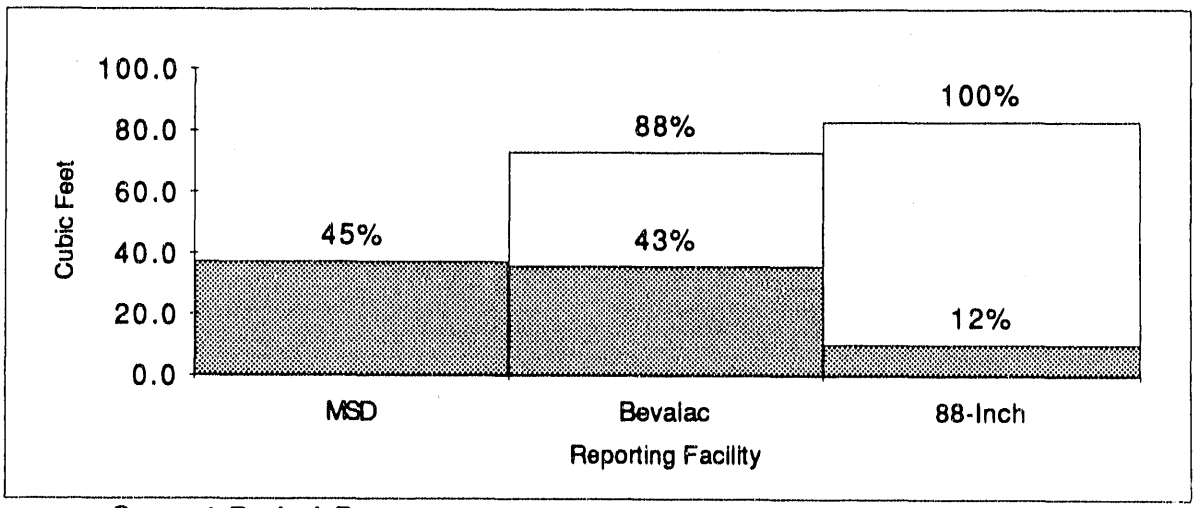
A slight increase in low level hazardous waste ready to ship was noted since the last reporting period.

4.7.2.3 Solid Low Level Hazardous Waste - Shipped

The total volume, in cubic feet, of low level hazardous waste shipped during the reporting period.

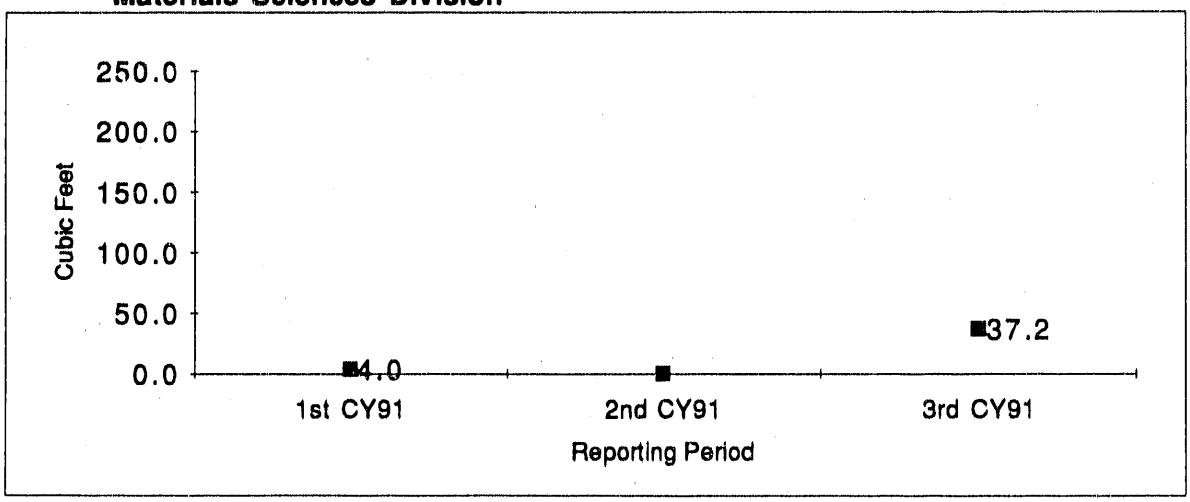


Shipment of low-level hazardous waste resumed during the third quarter. The amount shipped was the most to date.



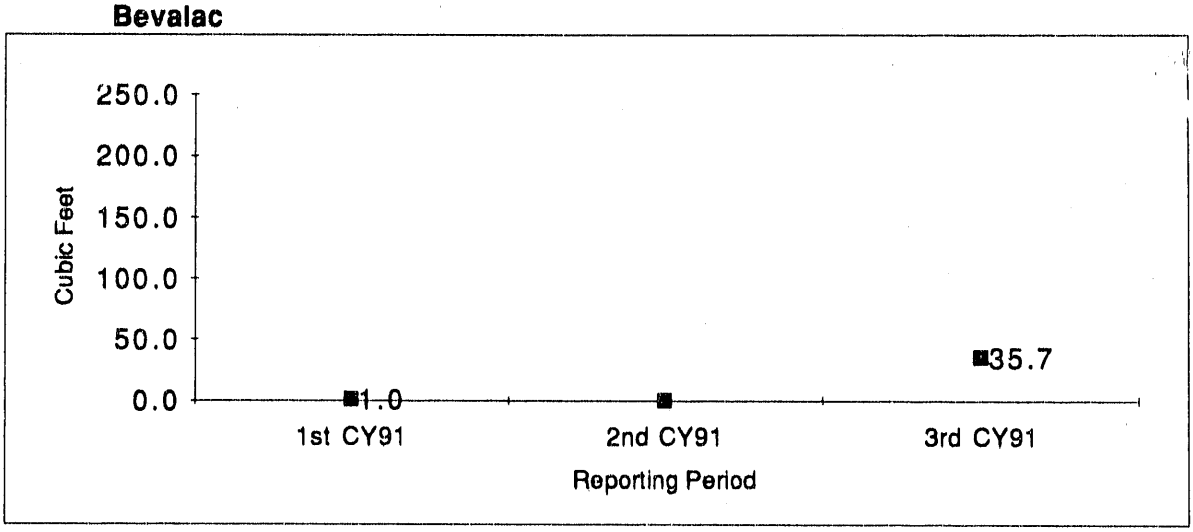
Current Period Data

Materials Sciences Division

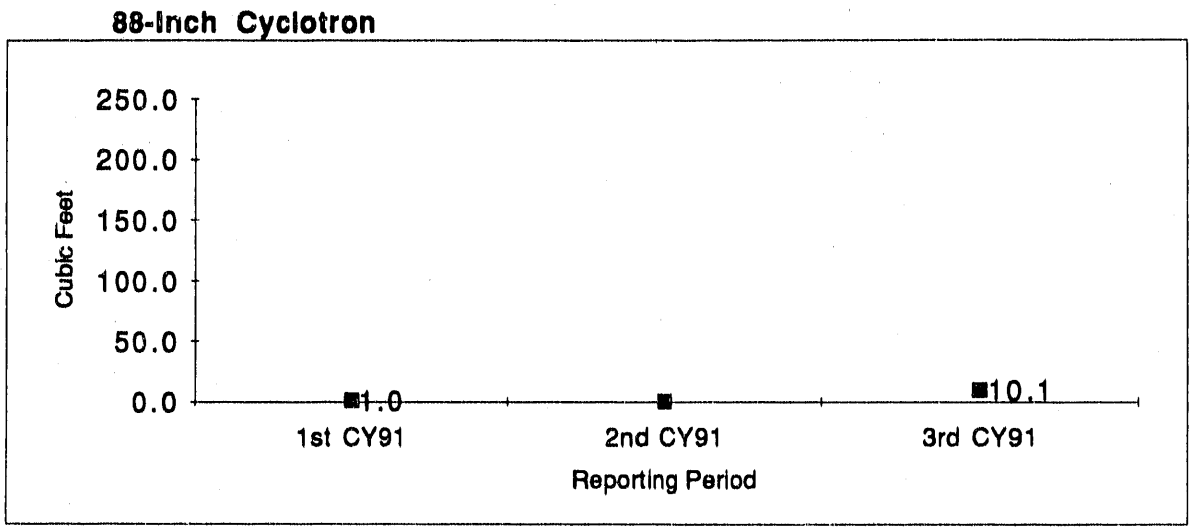


Shipments resumed in the third quarter of CY-1991.

Bevalac



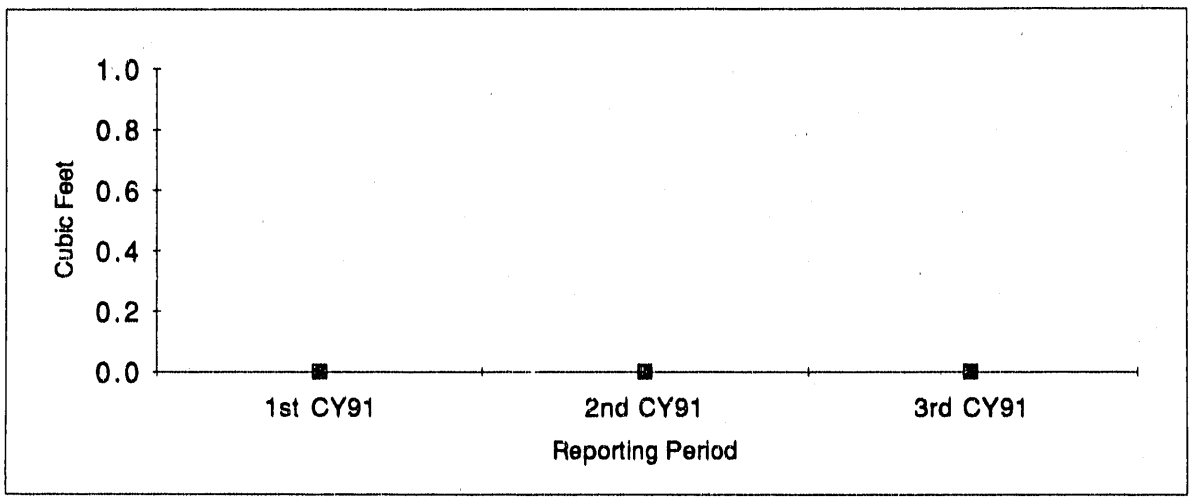
Shipments resumed in the third quarter of CY-1991.



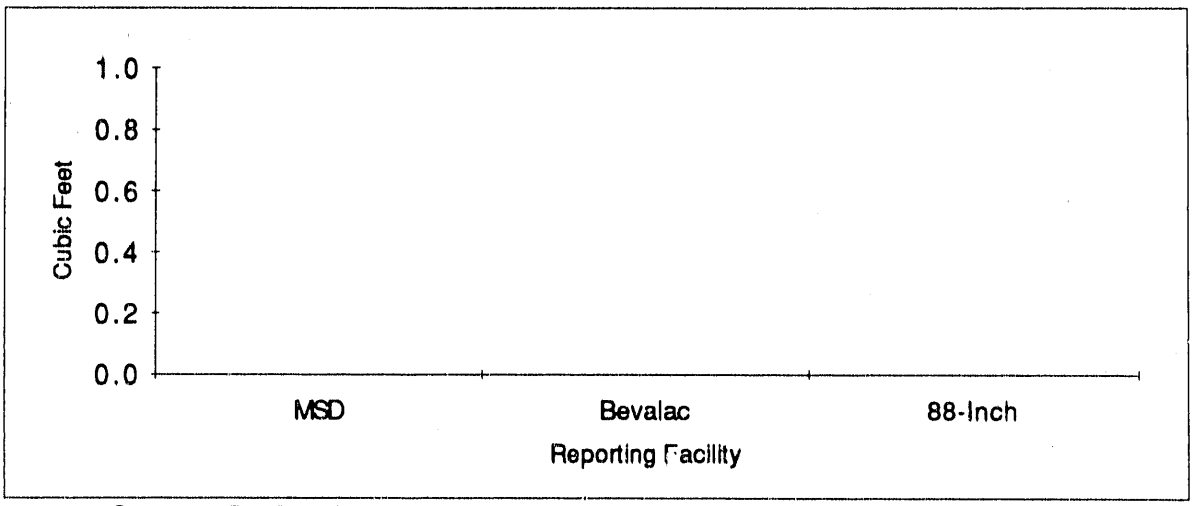
Shipments resumed in the third quarter of CY-1991.

4.7.3.1 Solid Low Level Mixed Waste - Generated

The total volume, in cubic feet, of low level mixed waste generated during the reporting period.



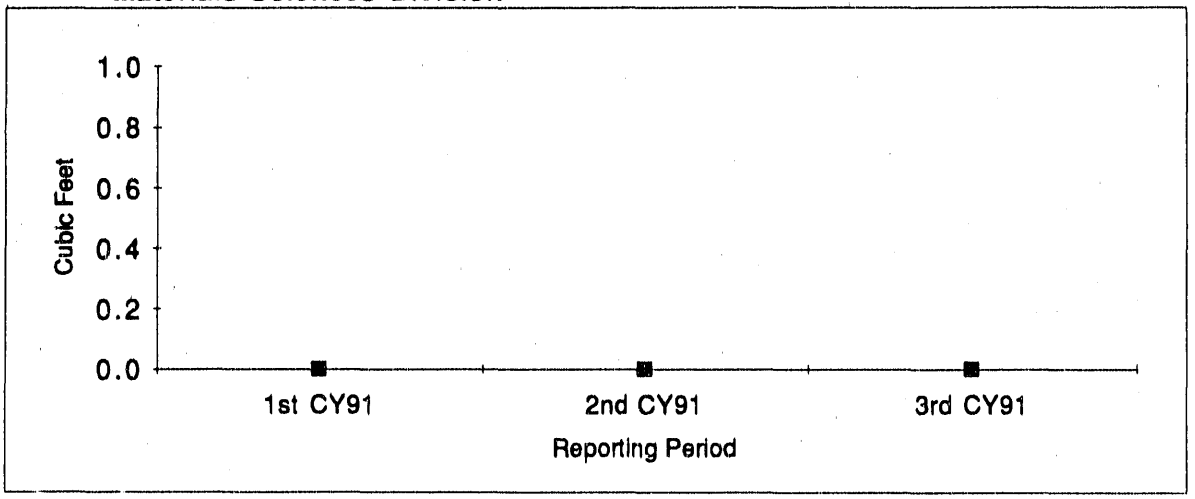
There has not been any low level mixed waste generated at LBL to date.



Current Period Data

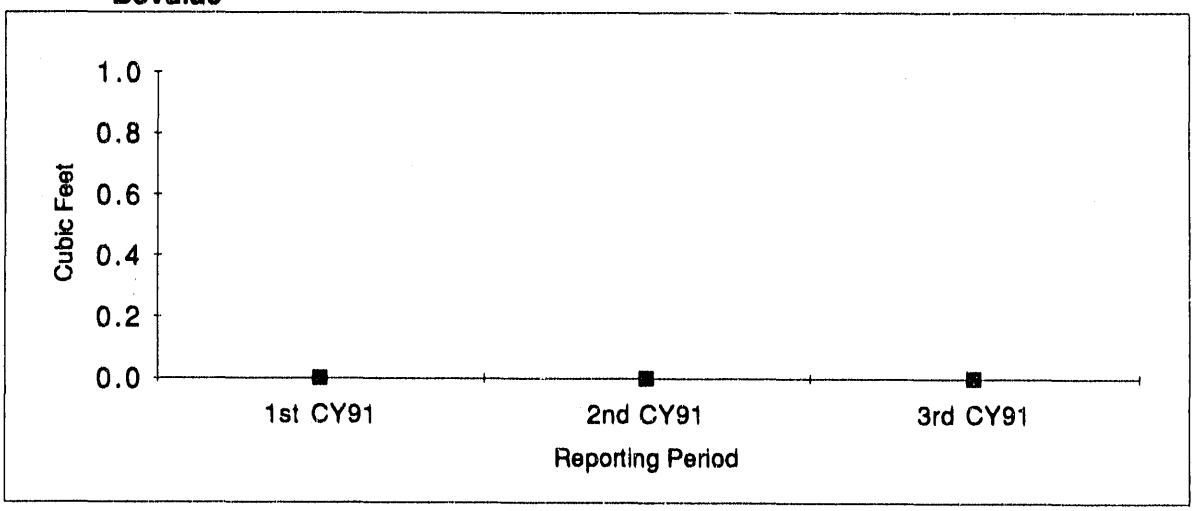
There was no low level mixed waste generated at LBL during the current reporting period.

Materials Sciences Division

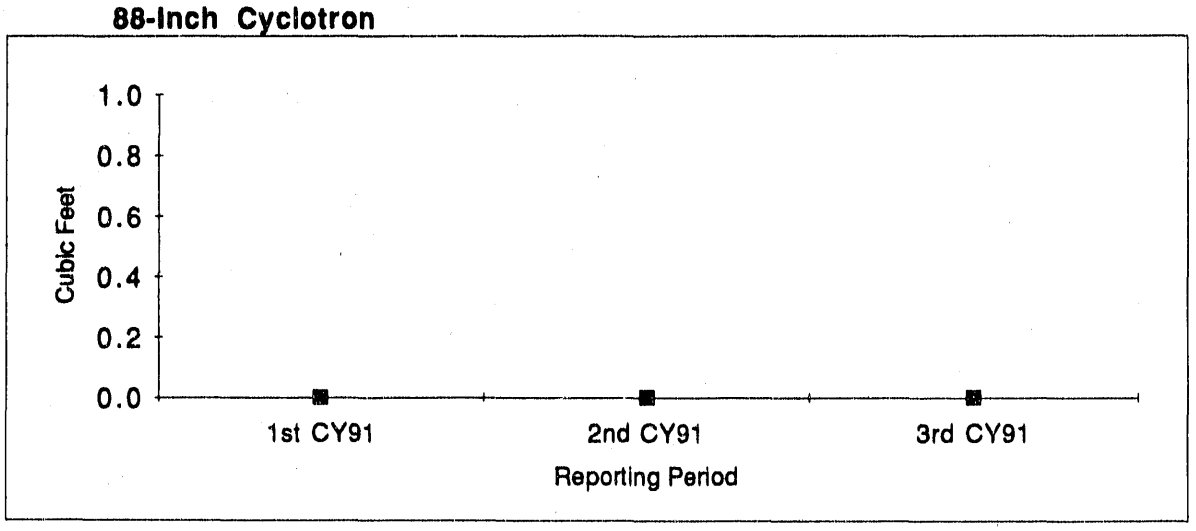


No low level mixed waste generated to date.

Bevalac



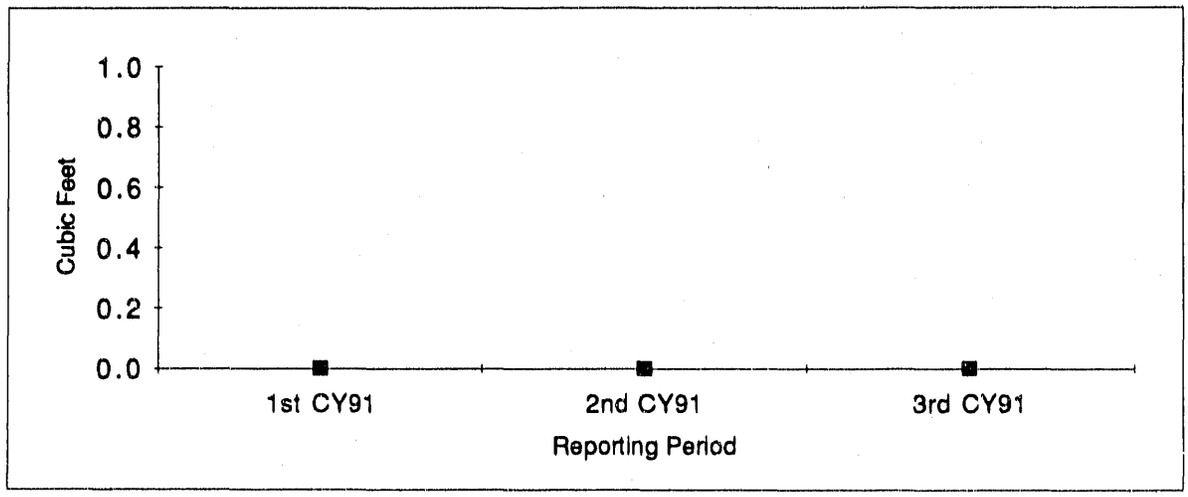
No low level mixed waste generated to date.



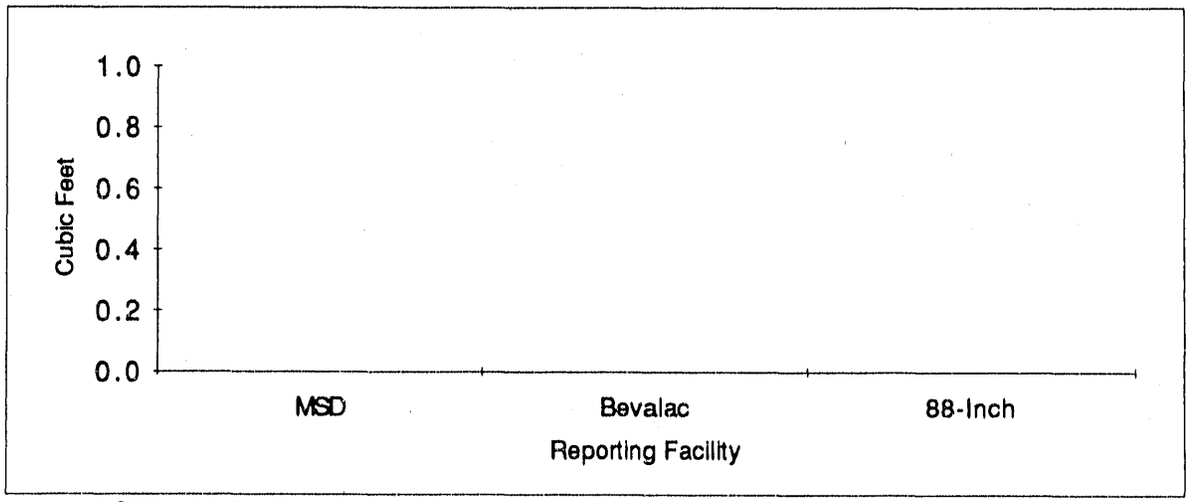
No low level mixed waste generated to date.

4.7.3.2 Solid Low Level Mixed Waste - Ready to Ship

The total volume, in cubic feet, of the final form (pending shipment) of low level mixed waste generated during the reporting period.



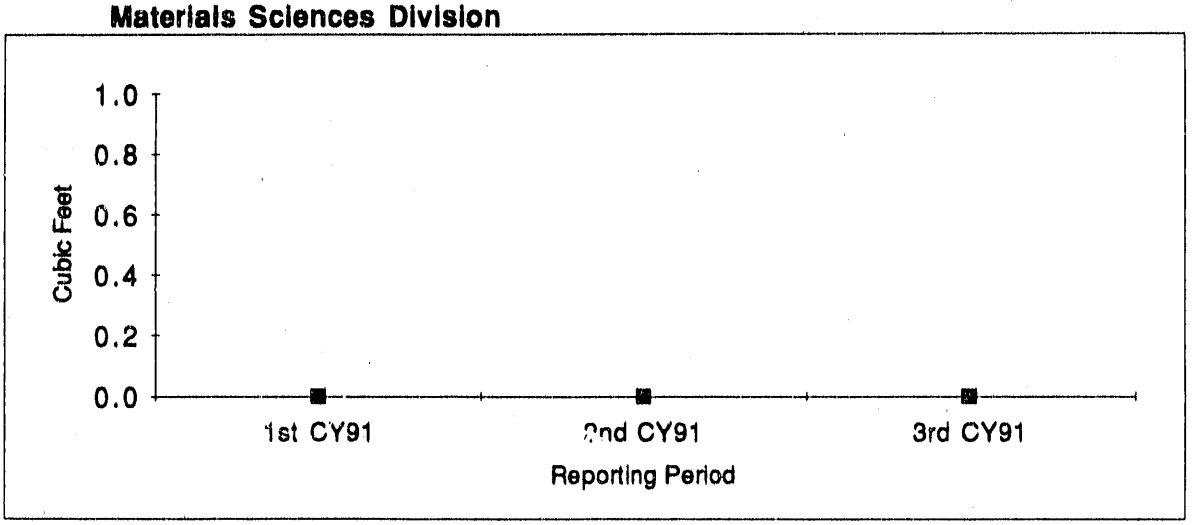
There has not been any low level mixed waste generated at LBL to date.



Current Period Data

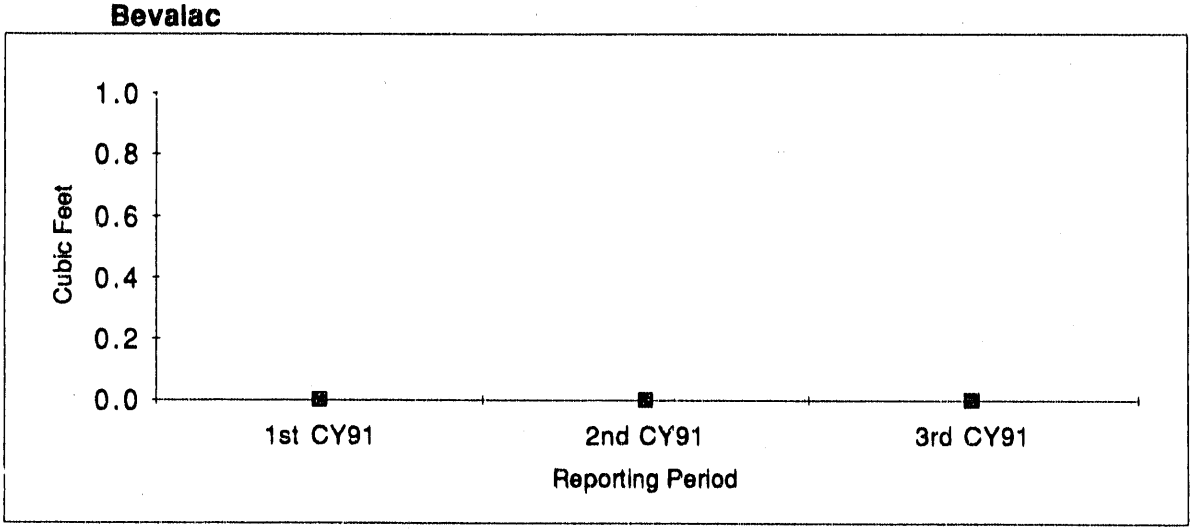
There was no low level mixed waste generated at LBL during the current reporting period.

Materials Sciences Division

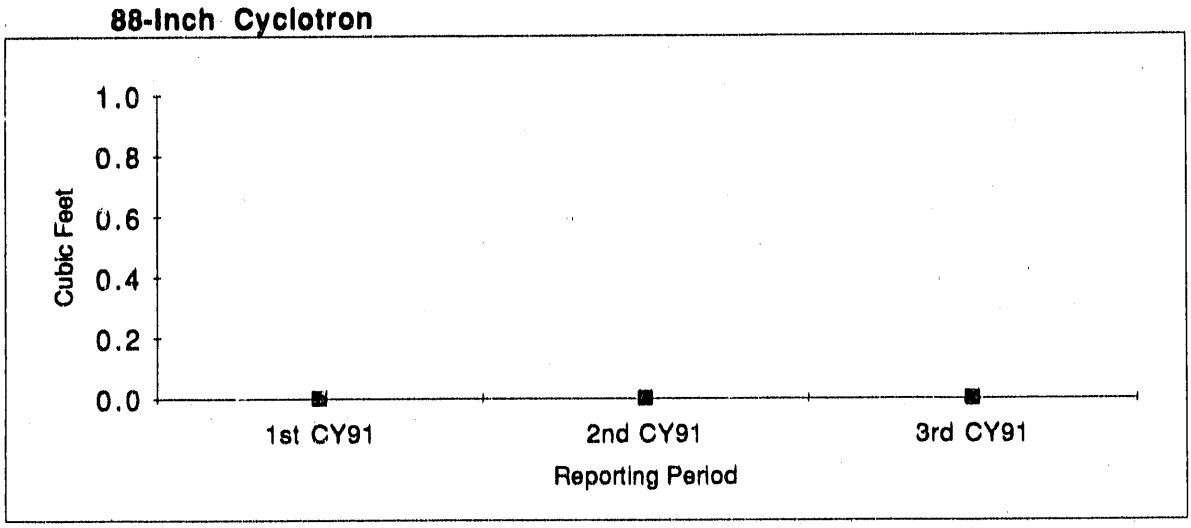


No low level mixed waste generated to date.

Bevalac



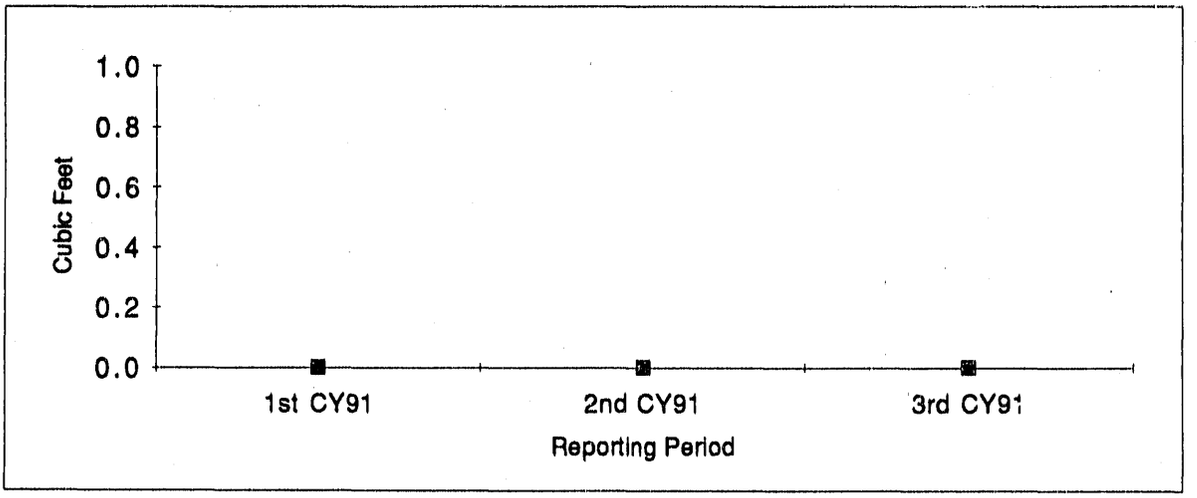
No low level mixed waste generated to date.



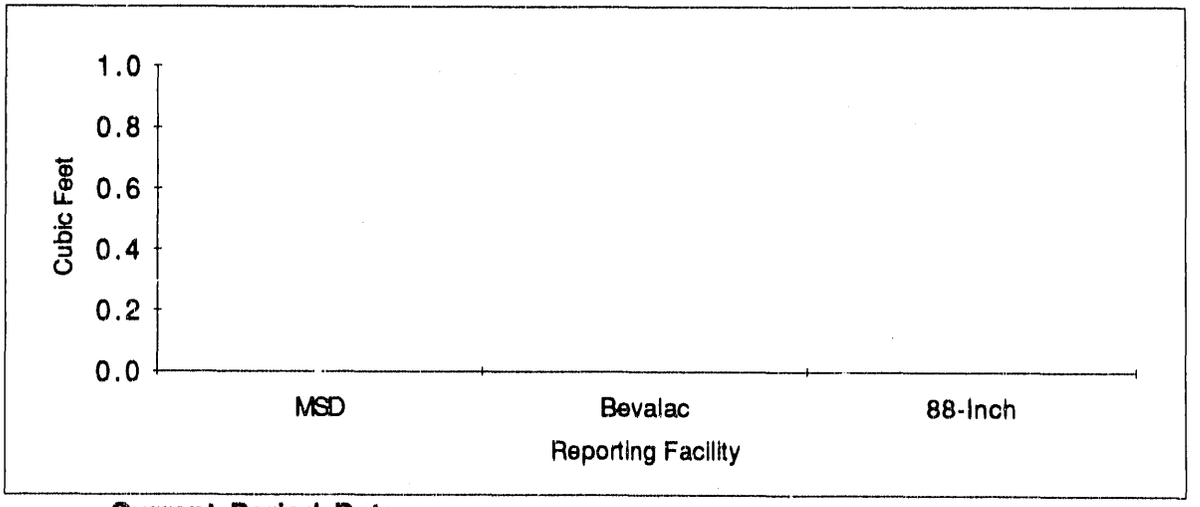
No low level mixed waste generated to date.

4.7.3.3 Solid Low Level Mixed Waste - Shipped

The total volume, in cubic feet, of low level mixed waste shipped during the reporting period.



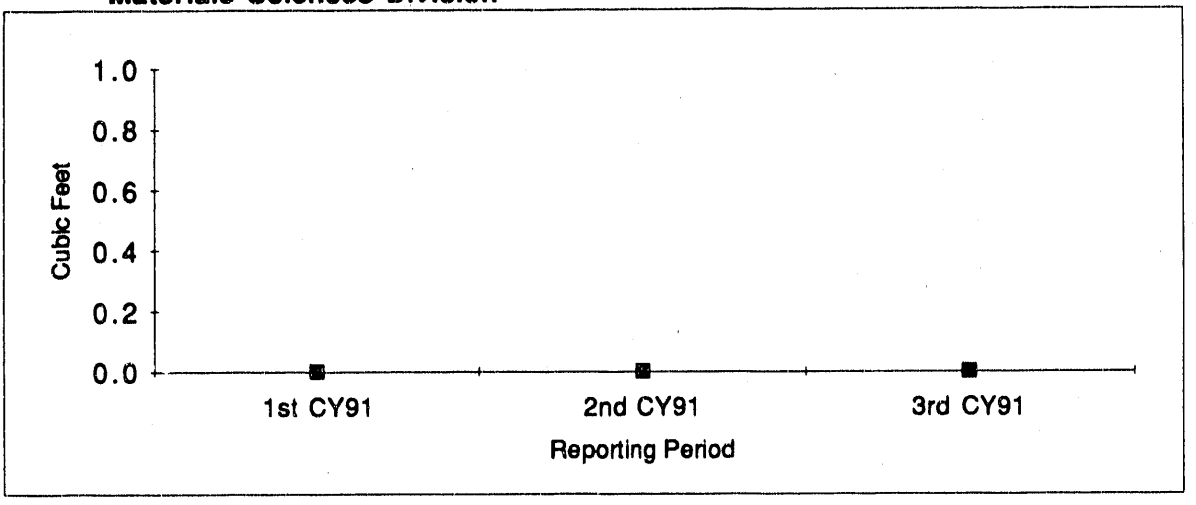
There has not been any low level mixed waste generated at LBL to date.



Current Period Data

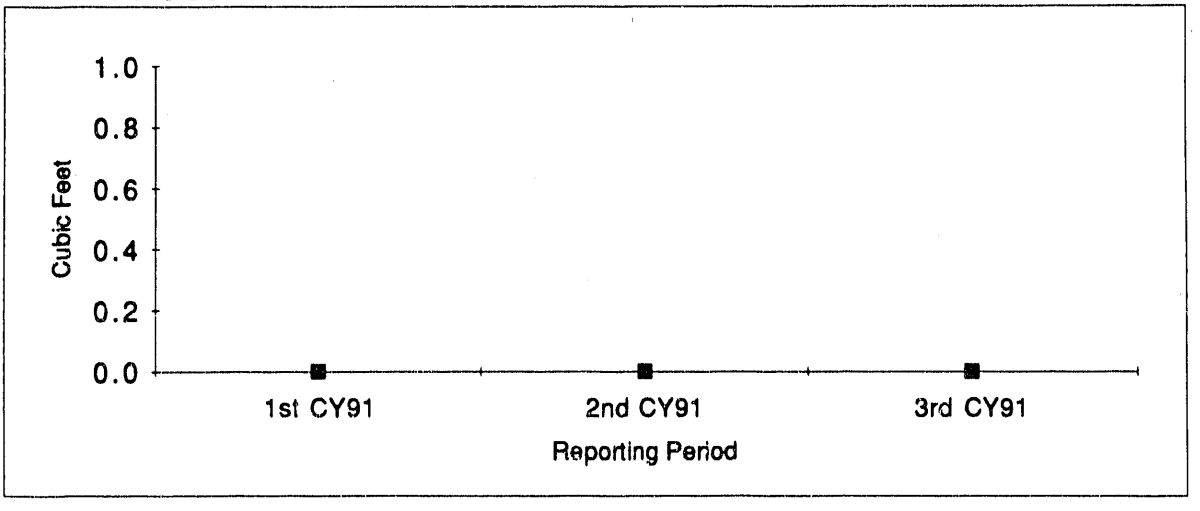
There was no low level mixed waste generated at LBL during the current reporting period.

Materials Sciences Division

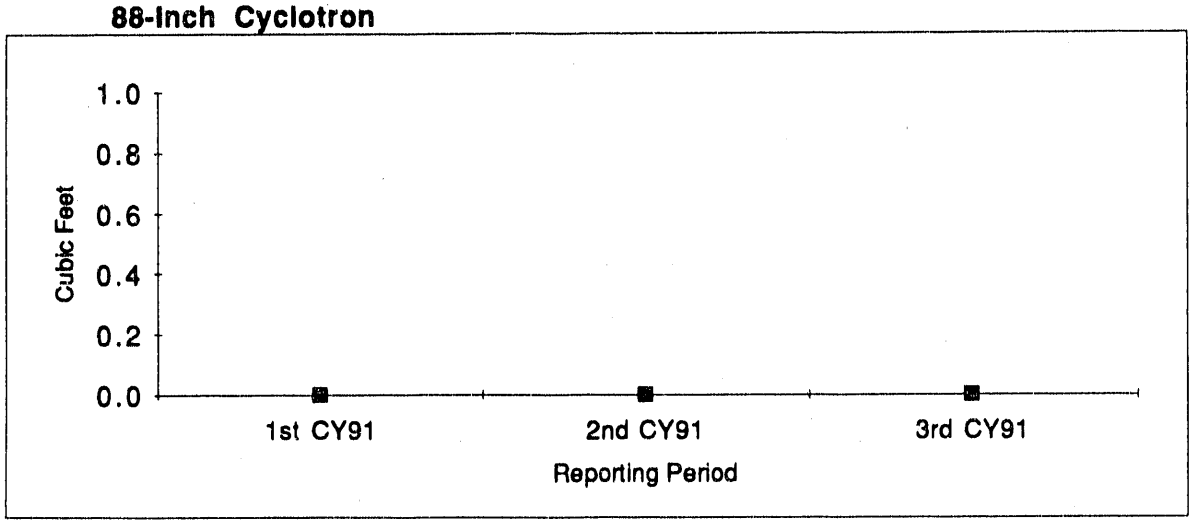


No low level mixed waste generated to date.

Bevalac



No low level mixed waste generated to date.



No low level mixed waste generated to date.

Appendix 3: Performance Indicator Definitions

This appendix provides descriptions of the 22 performance indicators of DOE facility performance. Comments on these definitions are anticipated from DOE contractors, Operations Office and Headquarters organizations. Based on the resolution of these comments, the performance indicator definitions may be revised with the numbering in SEN-29-91.

1.0 Personnel Safety

1.1 Collective Radiation Dose

Purpose: The purpose of this indicator is to measure the effectiveness of the facility radiation control program in maintaining facility personnel radiation exposures as low as reasonably achievable (ALARA).

Definition: The total external whole-body dose (deep and shallow) received by all facility personnel (including subcontractors and visitors) as measured by the primary dosimeter, i.e., thermoluminescent dosimeter (TLD), or film badge. Exposure measured by direct reading dosimeters should be included only for those periods or situations when more accurate data are not available. Collective radiation dose is reported in units of person-rem.

Notes: Data for this indicator are mainly collected quarterly by contractor. For reporting under this indicator, the data should be collected on a facility basis. It is recognized that the collective radiation dose for certain personnel (maintenance, health physicists, construction, etc.), due to their site-wide services, may be difficult to identify as resulting from exposure at a given facility. How these personnel are handled in each specific facility case should be discussed in the written descriptive statements that are provided with the data.

Data Needed: 1) Collective whole-body dose; by facility (units: person-rem)

1.2 Skin Contaminations

Purpose: The purpose of this indicator is to monitor progress in controlling radioactive contamination as a measure of the effectiveness of radiological work practices. A low number of contaminations indicates good radiological work practices, minimum contamination in areas intended to be free of contamination, and/or effective precautions for work in contaminated areas. This indicator is valuable for identifying adverse trends so that corrective actions can be taken.

Definition: The total number of confirmed skin and personal clothing contaminations for all facility personnel, including subcontractors and visitors. Skin or clothing contamination due to radioactive noble gases or naturally occurring radon gas are not included.

Data Needed: 1) Number of events, by facility

1.3 Internal Contaminations

Purpose: The purpose of this indicator is to monitor the effectiveness of radiological control programs to limit the internal uptake and deposit of radiological materials by facility personnel.

Definition: The total number of confirmed intakes or radioactive material for all facility personnel, including subcontractors and visitors, occurring during the reporting period.

Data Needed: 1) Number of events, by facility.

1.4 Radioactive or Hazardous Materials Overexposure

Purpose: The purpose of this indicator is to measure the overall effectiveness of the facility radiation and hazardous material control programs that are established to ensure the prevention of overexposures.

Definition: The number of reportable occurrences resulting from a personnel exposure (for all facility personnel, including subcontractors and visitors) to radioactive or hazardous materials in excess of limits established in DOE Orders.

Data Needed: 1) Number of events, by facility

1.5 Lost Work Day Cases (Lost Time Accident Rate)

Purpose: The purpose of this indicator is to measure the progress in improving industrial safety performance for personnel permanently assigned to the facility. This indicator measures the number of accidents that are serious enough to require time off from work.

Definition: Number of incidents for all facility personnel involving days away from work per 200,000 person-hours worked (100 person-years)

Notes: The definition that was indicated at the January 10, 1991 meeting has been modified to clarify the intent. That is, it is intended that the number of lost work day cases be reported, rather than the number of days lost.

Rate = (200,000 hours x number of events)/(total hours worked)

Data Needed: 1) Number of events, 2) Total hours worked, by facility

1.6 Recordable Injuries/Illnesses Rate

Purpose: The purpose of this indicator is to measure the progress in improving the industrial safety for personnel permanently assigned to the facility. By measuring all work-related injuries and illnesses meeting OSHA standards, this indicator measures all instances where work restrictions occur.

Definition: Total number of injuries or illness instances resulting from on-the-job activities that are recordable in accordance with OSHA standards, per 200,000 person-hours worked.

Notes: The definition of this indicator has been modified since the January 10, 1991 meeting to normalize the data and thereby produce a recordable injury/illness rate.

Rate = (200,000 hours x number of events)/(total hours worked)

Data Needed: 1) Number of events, 2) Total hours worked, by facility

2.0 Operational Incidents

2.1 Environmental Incidents

Purpose: The purpose of this indicator is to measure the effectiveness of the facility programs and controls in place to minimize inadvertent releases of radioactive or hazardous materials to the environment.

Definition: The number of reportable occurrences, both on-site and off-site, involving an inadvertent radioactive or hazardous material spill or release.

Data Needed: 1) Number of events, by facility

2.2 Unplanned Safety Function Actuations

Purpose: The purpose of this indicator is to monitor progress in reducing the number of instances of significant abnormal facility conditions, requiring the actuation of facility safety functions (equipment/systems). In addition, this indicator monitors the unnecessary exercising of facility safety functions, due to spurious or inadvertent signals, which could result in those functions not being available when needed. Limiting the number of unplanned safety function actuations indicates that an adequate margin of safety is being maintained.

Definitions: The number of unplanned actuations of any safety function or facility safety systems that occur when an actuation setpoint for a safety function is reached or when a spurious or inadvertent signal is generated, and major equipment is actuated or demanded. Unplanned means that the actuation was not part of a planned test or evolution.

Notes: For the purpose of this program, a safety function or system shall be defined to be consistent with the DOE Order 5000.3A definition of "Class A equipment" - any active or passive safety device/system or any primary environmental monitors.

Data Needed: 1) Number of events, by facility.

2.3 Violations of Operating Procedures

Purpose: The purpose of this indicator is to monitor the adequacy of facility training programs which emphasize compliance with procedures that are intended to ensure safety and effective facility operations. This indicator is a measure of the effectiveness of the safety culture and discipline of the management and staff of the facility.

Definition: The number of instances where a failure of personnel to follow operation procedures resulted in a reportable occurrence.

Data Needed: 1) Number of events, by facility.

2.4 OSHA Violations

Purpose: The purpose of this indicator is to monitor the adequacy of facility training programs which emphasize compliance with industrial safety standards, procedures and practices intended to ensure conduct of activities in a safe workplace. This indicator is a measure of the effectiveness of the safety culture and discipline of the management and staff of the facility.

Definition: The total number of times of noncompliance with OSHA standards.

Data Needed: 1) Number of events, by facility.

2.5 Unplanned Shutdowns

Purposes: The purpose of this indicator is to measure progress in minimizing unplanned shutdowns that result from equipment failures, personnel errors and other causes. In the case of reactors, only automatic shutdowns are included. Manual shutdowns to protect equipment or mitigate consequences of a transient are not counted because operator initiated shutdowns and actions to protect equipment should be discouraged. This indicator reflects the effectiveness of facility programs that support operations and permit the facility to meet its intended mission. These facility programs include, but are not limited to, maintenance, training, and engineering support for correction of design problems. Experience has generally shown that facilities that operate with a high availability rate (i.e., minimal number of unplanned shutdowns) are usually well-maintained, are managed and staffed by personnel that are competent and follow good operating practices and can be expected to have a high margin of safety.

Definition: The number of unscheduled shutdowns of a facility, process or operation.

Data Needed: 1) Number of events, by facility.

2.6. Emergency and Unusual Occurrences

Purpose: The purpose of this indicator is to provide an overall measure of the frequency of significant problems that arise at a facility. Reporting in accordance with DOE Order 5000.3A provides the details of each occurrence. This indicator provides a measure of the safety culture existing at the facility and the degree of control being maintained over the activities being conducted. Repeated significant problems are an indication of potentially reduced margins of safety for facility operations.

Definition: The number of Emergency and Unusual Occurrences reported in accordance with DOE Order 5000.3A, "Occurrence Reporting and Processing of Operations Information."

Data Needed: 1) Number of events, by facility

3.0 Environmental Releases (Normal Operations)

3.1 Radionuclide Effluent Releases

Purpose: The purpose of this indicator is to measure the effectiveness of radiological effluent control programs in place to minimize radionuclide releases to the environment.

Definition: Separate reporting for airborne and liquid releases to the environment, as measured at the point of release, for the following radionuclides: plutonium, uranium, noble gases, particulates (including radiocesiums and radiostrontium and activation products), radioiodine, tritium, and other actinides.

Data shall be cumulative over the reporting period and reported in units of curies.

Data Needed: 1) Airborne, curies (2) liquid, curies; by facilities.

3.2 Hazardous Substances/Regulated Pollutant Effluent Releases

Purpose: The purpose of this indicator is to measure the effectiveness of the facility programs in place to control and minimize releases to the environment of hazardous substances and regulated pollutants.

Definition: Separate reporting of the amounts of "permitted" airborne and liquid non-radioactive releases. All hazardous substances and regulated pollutants that are listed in permits (e.g., Clean Air Act or NPDES permits) or otherwise reported to regulators (e.g., through SARA Title III, Section 313 reporting requirements) are included. Data shall be cumulative over the reporting period and reported in units of pounds or gallons.]

Data Needed: 1) Airborne, cumulative pounds 2) Liquid: cumulative gallons; by facility.

3.3 Environmental Monitoring Data

Purpose: The purpose of this indicator is to measure the effectiveness of on-site programs to control radiological releases, and off-site programs to monitor radioactive materials in the environment from facility activities.

Definition: DOE 5400 series orders and guidance specify parameters, conditions and frequencies for environmental monitoring. Environmental monitoring data shall be reported in accordance with applicable site reporting requirements. These data include but are not limited to that for water (surface and ground), air, sediment, food and vegetation, milk, solid and direct radiation levels.

Notes: This indicator is intended, conceptually, to provide DOE management with information regarding the Department's off-site monitoring programs. As discussed at the January 10, 1991 meeting, it is difficult to specifically define this indicator and it was requested that input be provided to aid in this effort. Therefore, until such time that further guidance is developed, no data should be reported for this indicator.

Data Needed: As required by site specific monitoring requirements; by site.

4.0 Management

4.1 Open DOE Audit Issues

Purpose: The purpose of this indicator is to measure the responsibility of facility management and staff to findings, concerns and recommendations from oversight and line program assessments. This PI provides an indication of the management control and staff attitude toward improvements in the conduct of facility activities and openness to suggestions of outside DOE organizations.

Definition: The total number of findings, including concerns and recommendations requiring corrective actions, by oversight assessments and line program self-assessments for which contractor corrective actions have not been completed at the time of this report.

Notes: It is intended that the total number of issues which require contractor corrective actions, for which all corrective actions have not been completed, be reported for this indicator rather than the total number of open corrective actions. In addition, it is the intent that the issues reported be limited to those dealing with environment, safety and health and exclude, so as not to be duplicative, the data reported under OSHA violations.

Data Needed: 1) Number of issues, by contractor

4.2 Open External Organizations Recommendations

Purpose: The purpose of this indicator is to measure the responsiveness of DOE and facility management and staff to findings, concerns and recommendations from external organizations. This PI provides an indication of the management control and staff attitude toward improvements in the conduct of facility activities and openness to suggestions of external organizations.

Definition: The total number of recommendations by external organizations, such as the Advisory Committee on Nuclear Facility Safety, the Defense Nuclear Facility Safety Board, the National Academy of Sciences, etc., directed to specific contractors or their facility operations, for which contractor corrective actions have not been completed at the time of the report.

Notes: As for the previous indicator, it is intended that the total number of recommendations, with open corrective actions, be reported here, rather than the total number of open corrective actions.

Data Needed: 1) Number of recommendations, by contractor

4.3 Occurrence Reports with Open Corrective Actions

Purpose: The purpose of this indicator is to measure the commitment of DOE line program management and facility management and staff to taking timely corrective actions for improving facility operation and safety margins. This PI is an indication of the safety culture of the facility personnel by demonstrating follow-up and applying lessons-learned from occurrences.

Definition: The number of Final Occurrence Reports for which all corrective actions have not been completed at the time of the report.

Data Needed: 1) Number of final reports with open corrective actions, by facility.

4.4 Corrective Maintenance Backlog

Purpose: The purpose of this indicator is to measure the effectiveness of the programs in place to ensure necessary and timely repairs are made to facility equipment. Maintaining a small backlog is an indication of management control and staff concern regarding the material and safety status of the facility. It is a measure of effective planning, scheduling, coordination and materials management. Keeping long-standing deficiencies to a minimum enhances the ability to operate the facility and encourages facility personnel to report deficiencies.

Definition: The percentage of open corrective maintenance work requests, including those requiring facility or process shutdown, that are greater than three months old at the end of the reporting period. Corrective maintenance may include minor modifications if performed under a corrective maintenance work request.

Notes: The definition corrective maintenance is as follows:

Corrective (Repair) Maintenance: The repair of failed or malfunctioning equipment, system or facility to restore the intended function or design conditions. This maintenance does not result in a significant extension of the expected useful life.

Data Needed: 1) Number of open items > 3 months old, 2) total number of open items; by facility.

4.5 Preventive Maintenance Overdue

Purpose: The purpose of this indicator is to monitor progress in the administration and execution of facility preventive maintenance programs. A small percentage of preventive maintenance items overdue indicates a management and staff commitment to the preventive maintenance program and an ability to plan, schedule and perform preventive maintenance tasks as programs require. A facility with a good preventive maintenance program should require less emergency maintenance, which may be reflected in improved safety and reliability and more efficient operation.

Definition: The percentage of preventive maintenance items that were not completed within the originally scheduled interval.

Notes: The definition of preventive maintenance is as follows:

Preventive Maintenance; All those systematically planned and scheduled actions performed for the purpose of preventing equipment, system or facility failure.

In addition, it is the intent that, if a facility maintenance program is such that the scheduled time interval includes a grace period (i.e., $\pm$ 25% of the frequency of the maintenance), the item would not be considered overdue until that grace period has expired.

Data Needed: 1) Number of events, by facility

4.6 Substance Abuse Incidents

Purpose: The purpose of this indicator is to measure the effectiveness of DOE and facility specific fitness-for-duty programs. Individuals involved with controlled substances contribute to unsafe operating conditions and undermine efforts to accomplish the facility mission.

Definition: The number of reportable occurrences involving personnel use, possession or involvement of/with controlled substances, e.g., drugs, alcohol, etc.

Data Needed: 1) Number of events, by facility

4.7 Volume of Solid Waste Generated

Purpose: The purpose of this indicator is to monitor progress toward reducing the volume of solid low-level radioactive, hazardous and/or mixed waste destined for disposal. Reducing the volume will decrease storage, transportation and disposal needs and will decrease the environmental impact of such operations.

Definition: The total volume, in cubic feet, of solid low level radioactive and/or hazardous and/or mixed waste generated during the reporting period, separately reported, by facility.

Note: In response to comments and concerns raised during the meeting on January 10, 1991, the category of mixed waste has been added to the definition of this indicator. The reporting units shall be cubic feet. It is understood that all hazardous waste, regardless of the form, is considered to be solid waste.

Data Needed: (by facility)

Radioactive waste:
1) Volume generated
2) Volume in final form, pending shipment
3) Volume shipped for disposal

Hazardous waste:
1) Volume generated
2) Volume in final form, pending shipment
3) Volume shipped for disposal

Mixed waste:
1) Volume generated
2) Volume in final form, pending shipment
3) Volume shipped for disposal

Appendix 4: Root Cause Narratives

Following are brief descriptions by Performance Indicator of those incidents which require the root cause to be reported. Included are the Occurrence Report number and title, the date of discovery, the root cause, and the description of cause.

1.2 Skin Contaminations

No incidents to date.

1.3 Internal Contaminations

No incidents to date.

1.4 Radioactive/Hazardous Material Overexposures

(1) OR number : SAN-LBL-AFRD-1990-0028 (Elevated Personal Dosimeter Reading)

Discovered : 12/19/1990 (4th qtr. CY-1990)

Root cause : Management (Policy not adequately defined, disseminated, or enforced)

Description of cause:

A warning chime was relocated at least 5 years ago. The relocation involved turning the chime on its side, which made it inaudible, although it checked out electrically. At the time, no procedure existed for modification approval of personnel protective systems. A contributing cause was the design of the push button inside the cave, which allowed it to be routinely bypassed. The root cause is Bevalac management's failure to define a policy requiring any modification of a personnel protective system to undergo review and approval, no matter how slight the intended modification.

2.1 Environmental Incidents

(1) OR number : SAN-LBL-AFRD-1990-0007 (Possible PCB Contamination)
Discovered : 11/16/1990 (4th qtr. CY-1990)
Root cause : Management (Policy not adequately defined, disseminated, or enforced)
Description of cause:

The drain system, designed in 1950, did not separate the building drain system from that needed to remove ground water. The design appears to ensure that all substance entering the building drains mix with ground water. No procedures were in place in 1971, when the PCB spill occurred, to ensure that hazardous material spills in the building would not enter the building drain system, contributing to the cause. Management of the facility never looked into the design of the drain system with respect to ground water contamination. This failure allowed a system potentially dangerous to the environment to exist, and should be considered to the root cause.

(2) OR number : SAN-LBL-AFRD-1991-1001 (Freon Spill)
Discovered : 04/04/1991 (2nd qtr. CY-1991)
Root cause : Management (Inadequate administrative control)
Description of cause:

An older type of compression fitting failed about 14 hours after an injector cooling system was turned on, releasing Freon. More comprehensive inspections of the system after turn-on including use of a Freon leak detector, might have detected the failure in its early stages. Management should ensure that potentially hazardous systems, such as those which contain large amounts of Freon, are routinely checked for leaks, especially following system turn-on. Management failure to define an inspection procedure as part of system turn-on should be considered the root cause.

2.1 Environmental Incidents (cont.)

(3) OR number : SAN-LBL-MSD-1991-1001 (Sanitary Sewer Overflow into a Storm Drain)
Discovered : 04/26/1991 (2nd qtr. CY-1991)
Root cause : Personnel error (Violation of requirement or procedure)
Description of cause:

Paper towels and sanitary napkins are being flushed down the toilets. This practice results in clogged drain pipes. Although there are informal signs in some of the restrooms advising employees of the proper disposal of these items, management has not stressed the importance of adhering to this notice. "Official" signs will be purchased and installed in each restroom addressing the proper disposal of these items.

2.3 Violations of Operating Procedures

(1) OR number : SAN-LBL-MSD-1991-1002 (Improper Storage of Methyl Chloromethyl Ether)
Discovered : 02/01/1991 (1st qtr. CY-1991)
Root cause : Procedure (Lack of Procedure)
Description of cause:

When the material was purchased, personnel were not immediately provided information relating to OSHA Lab Safety Standards. Laboratory personnel failed to read MSDS indicating improper training. UC Campus EH&S was unaware MCME was in laboratory. A new action plan has been implemented to identify carcinogens when ordered and that appropriate handling and storage standards are in place.

(2) OR number : SAN-LBL-NSD-1991-1001
(Violation of Safety Requirements at the 88-Inch Cyclotron)
Discovered : 05/17/1991 (2nd qtr. CY-1991)
Root cause : To Be Determined
Description of cause:

Incident under investigation. Causes are yet to be determined.

2.5 Unplanned Shutdowns

No incidents to date.

2.6 Emergencies and Unusual Occurrences

(1) OR number : SAN-LBL-MSD-1991-1003
(Fire Presumed to be of Electrical or Chemical Origin)
Discovered : 04/25/1990 (2nd qtr. CY-1990)
Root cause : Design (Inadequate or defective design)
Description of cause:

Fire resulted from sparks coming from battery experiment into excessive combustible materials. Experiment was unattended and lacking proper safety devices.

(2) OR number : SAN-LBL-AFRD-1990-0028 (Elevated Personal Dosimeter Reading)
Discovered : 12/19/1990 (4th qtr. CY-1990)
Root cause : Management (Policy not adequately defined, disseminated, or enforced)
Description of cause:

(See item #1 under *1.4 Radioactive/Hazardous Material Overexposures* above)

(3) OR number : SAN-LBL-AFRD-1991-1001 (Freon Spill)
Discovered : 04/04/1991 (2nd qtr. CY-1991)
Root cause : Management (Inadequate administrative control)
Description of cause:

(See item #2 under *2.1 Environmental Incidents* above)

(4) OR number : SAN-LBL-MSD-1991-1004 (Possible PCB Contamination)
Discovered : 05/16/1991 (2nd qtr. CY-1991)
Root cause : Equipment/Material (Defective or failed part)
Description of cause:

An oil filled capacitor, as a component of an isolation/constant voltage transformer, failed in service. This unit was PCB filled and over 20 years old. Under current regulations and conditions, this is not a preventable situation as this small quantity of PCB is "non-reportable" and not marked on either the capacitor or transformer.

2.6 Emergencies and Unusual Occurrences (cont.)

(5) OR number : SAN-LBL-NSD-1991-1001

(Violation of Safety Requirements at the 88-Inch Cyclotron)

Discovered : 05/17/1991 (2nd qtr. CY-1991)

Root cause : To Be Determined

Description of cause:

(See item #2 under *2.3 Violations of Operating Procedures* above)

4.6 Substance Abuse Incidents

No incidents to date.

Appendix 5: Errata

Following is the latest Performance Indicator data errata for the first, second, and third quarters of CY-1991. Although most of this was included in the third quarter errata report dated 11/27/91, a few more errors have come to light, namely, PI 2.3 (Violation of Operating Procedures) in the first quarter data, PI 2.6 (Unusual Occurrences) in the second quarter data, and PI 1.1 (Collective Radiation Dose) in the third quarter data.

First Quarter CY-1991 Errata

1.5 Lost Work Day Cases (Lost Time Accident Rate) (1st Qtr. CY-1991)

The *total hours worked* given for the three LBL facilities were for one month only.

- Correct data

	Total	MSD	Bevalac	88" Cyclo.
Number of Events	2	0	1	1
Total hours worked	170,920	96,000	65,000	9,920
Lost Time Accident Rate	2.34	0.00	3.08	20.16

2.3 Violation of Operating Procedures (1st Qtr. CY-1991)

Originally reported as zero for all facilities, zero total. In fact, there was one incident in the Materials Sciences Division (SAN-LBL-MSD-1991-1002). The root cause for this occurrence was "lack of procedure".

- Correct data: one for MSD, zero for Bevalac, zero for 88" Cyclotron, one total.

4.3 Occurrence Reports with Open Corrective Actions (1st Qtr. CY-1991)

Originally the number of reports was given as two for the Bevalac, two total. Upon re-examination, we find that there were in fact two for the MSD (Nos. SAN-LBL-MSD-1991-1002, -1003) and three for the Bevalac (Nos. SAN-LBL-AFRD-1991-0028, -1001, -1007), five total.

- Correct data: two for MSD, three for Bevalac, zero for 88" Cyclotron, five total.

Second Quarter CY-1991 Errata

1.4 Radioactive/Hazardous Materials Overexposures (2nd Qtr. CY-1991)

Originally reported as one event for the Bevalac (LBL-90-28-51-8), one total. The event reported for the Bevalac occurred in 1990 and should not have been reported.

- Correct data: zero for all facilities, zero total.

2.1 Environmental Incidents (2nd Qtr. CY-1991)

Originally reported as one event for the MSD (LBL-MSD-1991-1001) and two for the Bevalac (LBL-AFRD-1990-0007 and LBL-AFRD-1991-1001), three total. LBL-AFRD-1990-0007 occurred in 1990 and should not have been reported.

- Correct data: one for MSD, one for Bevalac, zero for 88" Cyclotron, two total.

2.3 Violations of Operating Procedures (2nd Qtr. CY-1991)

Originally reported as one event for the Bevalac (LBL-90-28-51-8) and one for the 88" Cyclotron (LBL-NSD-1991-1001), two total. The violation at the Bevalac should not have been reported (see 1.4 above).

- Correct data: zero for MSD, zero for Bevalac, one for 88" Cyclotron, one total.

2.6 Emergency and Unusual Occurrences (2nd Qtr. CY-1991)

Originally reported as one for the Bevalac (SAN-LBL-AFRD-1991-1001), and one for the 88" Cyclotron (SAN-LBL-NSD-1991-1001), two total. There was also and unusual occurrence in the MSD (SAN-LBL-MSD-1991-1004), which had "material" as its root cause.

- Correct data: one for MSD, one for Bevalac, one for 88" Cyclotron, three total.

4.3 Occurrence Reports with Open Corrective Actions (2nd Qtr. CY-1991)

Originally reported as zero entries for all facilities due to a misinterpretation. Actually there were four for the MSD (Nos. SAN-LBL-MSD-1991-1001, -1002, -1003, -1004), two for the Bevalac (Nos. SAN-LBL-AFRD-1991-0028, -1007), and one for the 88" Cyclotron (SAN-LBL-NSD-1991-1001). Seven total.

- Correct data: four for MSD, two for Bevalac, one for 88" Cyclotron., seven total.

Third Quarter CY-1991 Errata

1.1 Collective Radiation Dose (3rd Qtr. CY-1991)

On the Third Quarter data sheet submitted on 11/27/91, the collective radiation dose data was reported as 0.089 person-rem for the MSD, 0.180 for the Bevalac, and 0.296 for the 88" Cyclotron, 0.565 person-rem total. These figures are in error. The correct figures follow:

- Correct data (in *person-rem*): 0.049 for the MSD, 0.099 for the Bevalac, 0.168 for the 88" Cyclotron, 0.316 total.

DISCLAIMER

END

DATE
FILMED
5/7/92