

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-373/94010(DRSS); 50-374/94010(DRSS)

Docket No. 50-373; 50-374

License No. NPF-11; NPF-18

Licensee: Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 300
Downers Grove, IL 60515

Meeting Conducted: April 5, 1994

Meeting Location: Region III Office
801 Warrenville Road
Lisle, IL 60532

Type of Meeting: Enforcement Conference

Inspection Conducted: LaSalle Site, Marseilles, IL
February 14 to March 4, 1994

Inspector: Patrick L. Loudon
Patrick L. Loudon
Radiation Specialist

4/7/94
Date

Reviewed By: William G. Snell
William G. Snell, Chief
Radiological Controls Section 2

4/7/94
Date

Approved By: John A. Grobe
John A. Grobe, Acting Chief
Reactor Support Programs Branch

4/10/94
Date

Meeting Summary:

Enforcement Conference on April 5, 1994 (Report No. 50-373/94010(DRSS); 50-374/94010(DRSS))

Areas Discussed: Two apparent violations and continued concerns with licensee performance in the radiation protection area were discussed. The first apparent violation involved the deliberate contaminating of female radiation workers' clothing which occurred on two separate occasions in November 1993. The second violation involved the failure to perform a survey to assess radiological hazards during a radioactive waste sample collection in February 1994. Other NRC concerns were also discussed specifically, the apparent complacency chemistry technicians had developed with respect to using survey meters when performing tank sample collections, and overall observations of NRC management on the continuing declining trend at the station regarding radiological control matters.

DETAILS

1. Persons Present at the Enforcement Conference

Commonwealth Edison Company

W. Murphy	LaSalle Site Vice President
D. Ray	LaSalle Station Manager
D. Farr	LaSalle Technical Services Superintendent
L. Oshier	LaSalle Health Physics Services Supervisor
S. Wilkerson	LaSalle Chemistry Supervisor
E. Martin	LaSalle Quality Verification Director
J. Lockwood	LaSalle Regulatory Assurance Supervisor
F. Rescek	Corporate Director, Radiation Protection
M. Lesniak	Corporate Radiation Protection Supervisor
P. Barnes	Corporate Regulatory Services
G. Benes	LaSalle Corporate Nuclear Licensing Administrator
S. Trubatch	Attorney

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J. Martin	Regional Administrator
W. Axelson	Director, Division of Radiation Safety and Safeguards
J. Grobe	Acting Chief, Reactor Support Programs Branch
W. Snell	Chief, Radiological Controls Section 2
A. Gody	LaSalle Project Manager, NRR
P. Loudon	Radiation Specialist
H. Simons	LaSalle Reactor Engineer
E. Schweibinz	LaSalle Lead Engineer
B. Bersen	Regional Counsel
P. Pelke	Enforcement Specialist
E. Pawlik	Director, Region III Office of Investigations
R. DeVitto	Region III Office of Investigations

2. Enforcement Conference

An enforcement conference was held in the NRC Region III Office on April 5, 1994. This conference was conducted as a result of the preliminary findings of the inspection conducted from February 14 to March 4, 1994, in which apparent violations of NRC regulations were identified. Inspection findings were documented in Inspection Report 50-373/94004(DRSS); 50-374/94004(DRSS), transmitted to the licensee by letter dated March 21, 1994.

The purpose of this conference was to (1) discuss the apparent violations, their causes, and the licensee's corrective actions; (2) determine if there were any escalating or mitigating circumstances; and (3) obtain any information which would help determine the appropriate enforcement action.

Following an introduction by the Director of the Division of Radiation Safety and Safeguards, the following apparent violations were presented:

- The inappropriate use of licensed material contrary to License Conditions 2.B.3 and 2.B.4. Specifically, the deliberate contamination of two female radiation workers' clothing on two separate dates in November 1993.
- The failure to perform a survey to determine the extent of radiation hazards incident to workers contrary to 10 CFR 20.1501(a)(2)(i) and (iii). A radioactive waste tank sample was collected on February 22, 1994, by unqualified individuals who did not verify the dose rates from the sample. Subsequent surveys revealed that the sample displayed dose rates in the 2.5 rem/hr (0.025 Sv/hr) range.

NRC management also presented concerns with chemistry technicians not following procedural requirements and prudent radiological practices, and, the continued observation of cultural problems at the station.

The licensee's representatives described the events which led to the apparent violations, including root causes and corrective actions taken immediately following the event.

Licensee representatives also presented a synopsis of their broad corrective actions stationwide which were the result of a Business Development Team review conducted in November 1993. The area of focus was the station's radiation protection program and how station management plans to address radiation worker culture issues.

At the conclusion of the meeting, the licensee was informed that they would be notified in the near future of the final enforcement action.

Attachment: Commonwealth Edison Company handouts

APRIL 5 , 1994

LASALLE ENFORCEMENT CONFERENCE

RADIATION PROTECTION PROGRAM

AGENDA

INTRODUCTION	W. P. MURPHY
RADIATION PROTECTION PROGRAM	D. M. FARR
RADWORKER CULTURE/ATTITUDE	D.J. RAY
CLOSING	W. P. MURPHY

ATTACHMENT 1 - CONTAMINATION EVENT

ATTACHMENT 2 - SAMPLING EVENT

ATTACHMENT 3 - SURVEYS WHILE SAMPLING



RADIATION PROTECTION PROGRAM

PROBLEM STATEMENT

The implementation of the Radiation Protection Program at LaSalle requires significant enhancement as evident from several events that reveal weaknesses in LaSalle's culture and administration of program requirements. Radiation Workers are inconsistent in the understanding and implementation of fundamentals, attention to detail, proactivity and their regard for rules, procedures, and radiation hazards. Radiation Source Term is high which contributes to radiation exposures which are comparatively among the highest in the industry.

Ineffective management and leadership have been large contributors to declining performance in the area of Radiation Protection at LaSalle Station. The specific causal factors include:

- the inability to set and communicate clear expectations
- standards of performance which are set too low
- failure to hold supervisors and workers accountable for their performance
- ineffective resource utilization and allocation

These causal factors have led to:

- station workers receiving high collective radiological dose
- many workers who do not understand or respect the radiological hazard
- many workers who are not rigorous in following good radiological work practices
- a high percentage of the plant area which is radioactively contaminated
- high radiation area controls which have not been fully effective.
- plant processes and controls which have not been fully effective at preventing radioactive material from leaving the Radiologically Protected Area (RPA)

LASALLE'S VISION OF THE FUTURE

The station's workforce has a fundamental knowledge of good radiation protection work practices which fosters an excellent radiation worker performance culture. The station's ALARA and Source Term Reduction programs are effective, resulting in above average performance in controlling radiation exposures.

LaSalle's total radiation exposure goal for 1996 is 550 person-REM. These goals are shown on Figure 1. The accumulated exposure shown for years 1989 through 1993 represent actual plant data (year of exposure) plotted against the actual INPO industry quartiles. The projected exposure shown for years 1994 through 1998 (also year of exposure data) are plotted against the INPO industry quartiles which have been extrapolated based on the rate of industry improvement seen over the last three years. The exposures shown for 1989, 1992, 1995 and 1998 represent exposures received during dual-unit outage years.

ACTION PLAN SUMMARY

In order to achieve our desired end state, there are many actions that we will carry out which address improvements in both the Program and Rad Worker Practices areas. Detailed action plan steps are delineated in the LaSalle Business Unit Plan (BUP), and were summarized in a meeting with the Region III staff which was held on Tuesday, March 29th. An overview of LaSalle's Dose Reduction Program is shown on Figure. 2.

LaSalle's dose reduction initiatives represent a diverse and multi-faceted approach for improving our performance.

Inventory Reduction

Inventory reduction initiatives involve removing and reducing the existing source term. Some of these initiatives include "hot spot" removal thorough our hot spot reduction program, chemical decontamination of the recirculation system piping during refueling outage L1R06, and the planned chemical decontamination of the residual heat removal (RHR) and reactor water cleanup (RWCU) systems during refueling outages L2R06 and L1R07 in 1995. A more detailed description of some of these initiatives is provided below:

- A number of hot spots in the plant have been reduced during the L1R06 outage. The remaining hot spots have been identified, prioritized, and plans to eliminate specific hot spots will continue to be implemented through the remainder of the L1R06 refueling outage and beyond. Station health physics personnel estimate a dose savings of 10 person-rem in 1994 increasing to 50 person-rem per year in 1996 will result from these initiatives.
- LaSalle will be conducting a chemical decontamination of the recirculation system during the L1R06 refueling outage. The station will be using a LOMI-AP-LOMI process. An estimated dose reduction of 200 person-REM is expected as a result of this process. Additionally, the station is performing an engineering evaluation for the installation of taps to allow chemical decontamination to be conducted on the RHR and RWCU systems in L2R06 (spring 1995) and L1R07 (fall 1995).

Optimized Water Chemistry

The Optimized Water Chemistry initiatives are focused at reducing the concentration of reactor water impurities before they become irradiated. Iron reduction and depleted zinc injection are two activities of the optimized water chemistry program which should result in accumulated dose reduction. They are described in greater detail below:

- Iron Reduction - Iron transport is the primary mechanism for the migration of cobalt-60 to out of core surfaces. An enhanced crud removal resin has been installed in six of the demineralizers on unit one. The seventh demineralizer will be replaced prior to restart following L1R06. Corrosion coupons, installed during L1R05 have been removed for analysis of high erosion/corrosion areas of the main condenser
- Depleted Zinc Injection - Zinc and cobalt compete for the same oxidation sites on the inside surface of the stainless steel piping. When zinc is present in the reactor water at 5 to 15 ppb, the corrosion films formed on both the piping and the fuel are thinner and more tightly adhering. This results in a larger percentage of the cobalt remaining on the cladding of the fuel rods where it can ultimately be discharged from the core.

A temporary "skid-mounted" system became operable on unit one in February 1994. The permanent system will be installed in September 1994. Unit two will begin operation on zinc in January 1995.

The use of depleted zinc injection augments the chemical decontamination process by ensuring that cobalt buildup occurs at a substantially reduced rate. The estimated dose rate savings is expected to be 141 person REM following the first full cycle of operation, and 226 person REM following three cycles of operation.

Source Term Reduction

Cobalt-60 is the largest contributor to dose at LaSalle. LaSalle's source term reduction initiatives are focused at reducing the stellite contribution to cobalt buildup. Stellite reduction initiatives at LaSalle are focused in two areas: Control Rod Blade (CRB) changeouts and stellite containing valve replacement.

- Control Rod Blade Changeouts - The largest cobalt contribution from the control rod blades come from the stellite pins and rollers. As these blades reach the end of their useful life, they will be replaced with non-stellite components. Fifteen CRBs are being changed out during the L1R06 refueling outage.

Source Term Reduction (continued)

- Valve Replacement - LaSalle has identified its top "stellite valves". These valves have been prioritized into three categories, based on cobalt release rates. Priority I valves are valves that have been determined to be the principal cobalt contributors. Priority I valves will be replaced with non-stellite components whenever valve maintenance or plant modification warrants. Parts for priority I valves will either be stocked on the shelf or will be ordered, if lead times are sufficiently short. Priority II valves are those valves which contribute, to a lesser degree, to the plant's cobalt concentration and in not in the main flow of the reactor coolant system. Replacement of these valves will be done on a case by case basis, based on parts availability (parts would not normally be stocked for these valves). Priority III valves are those valves not wetted by the reactor coolant system. There are presently no plans to replace priority III valves with non-stellite components.

New Technology and the use of Engineering Controls

Improvement initiatives in this area include the enhanced use of video equipment and robotics and the more extensive use of engineering controls during radiation worker activities.

An emerging technology, that is being evaluated for use at LaSalle, is the video tour computer program. This is a computer based video program that could be used as a dose reduction tool for engineering, maintenance and training evolutions. The video program is in use at Dresden and has resulted in dose saving because many of the pre-job briefings, modification scoping studies, etc. no longer require an in-plant walkdown. The station is evaluating the feasibility of having the filming for this program done during 1995, when access to both units' drywell will be available because of the dual unit outage year.

LaSalle plans to implement a new access control system in the fall of 1994. This control system would be computerized and replace the current access tracking system. It will allow for direct communication to individual workers or groups of workers. It will provide the ability to lockout access for key requirements that have not been fulfilled.

Station personnel have expanded the use of proven technologies. The use of wireless remote monitors is being expanded during the L1R06 chemical decontamination process to gauge the effectiveness of dose rate reduction on the RR system piping without requiring a health physics technician to make a drywell entry for surveys.

New Technology and the use of Engineering Controls (continued)

The expanded use of engineering controls has resulted in a significant savings estimate for the 1A residual heat removal pump rebuild job. This project, being conducted during L1R06, was originally projected to have a 27 person-REM exposure. Through the use of detailed planning, HEPA filters and CAM monitors, lead shielding, bead-blaster decontamination, underwater parts storage, hydrolazing, and remote camera equipment, this job estimate has been reduced to 10 person-REM. The planning for this job represents a significant change in the thought processes which have been routinely used for pre-job planning at LaSalle.

Video cameras have been positioned in the heater bay on both units to access condensate and heater drain system leakage, without requiring heater bay entry when the unit is at power.

LaSalle personnel will be participating in the robotics seminar, being sponsored by Byron Station, in April 1994. It is anticipated that this seminar will provide our people with new ideas for robotics usage.

Techniques, Processes, Procedures and Training

These initiatives represent changes that will result in near term benefits - benefits to be seen this year. These improvements involve changes to radworker techniques and processes, radiation protection procedures and radworker training. Some of these improvement initiatives are described in greater detail below:

- Radiation protection (RP) department personnel have started a RP procedure improvement initiative. The focus of this initiative is to simplify and streamline procedures, making them more effective and easier for the radworker to understand and comply with. Currently, the Radiation Work Permit (RWP) program is being revised for clarity and ease of use. Part of this effort involves development of a standardized survey map for content and layout. LaSalle RP personnel are working closely with Byron Station personnel in the revision of the station's RWP program.
- The emphasis on intradepartmental communication has been increased. The station presently has RP ALARA supervisors physically located in key work areas with the operating and maintenance departments. There is an RP representative assigned to the L1R06 "Work Control Center". This individual functions as a single point of contact for RP issues identified during outage planning and execution operations. Radiation Protection department representatives attend weekly communications sessions with the line organization in order to provide increased emphasis on radworker rules and practices. The RP department routinely publishes informational articles which are distributed in the stations newsletter "STAR". "Just a minute", an RP department publication is generated weekly to provide department heads with discussion topics that may be used daily during departmental meetings.

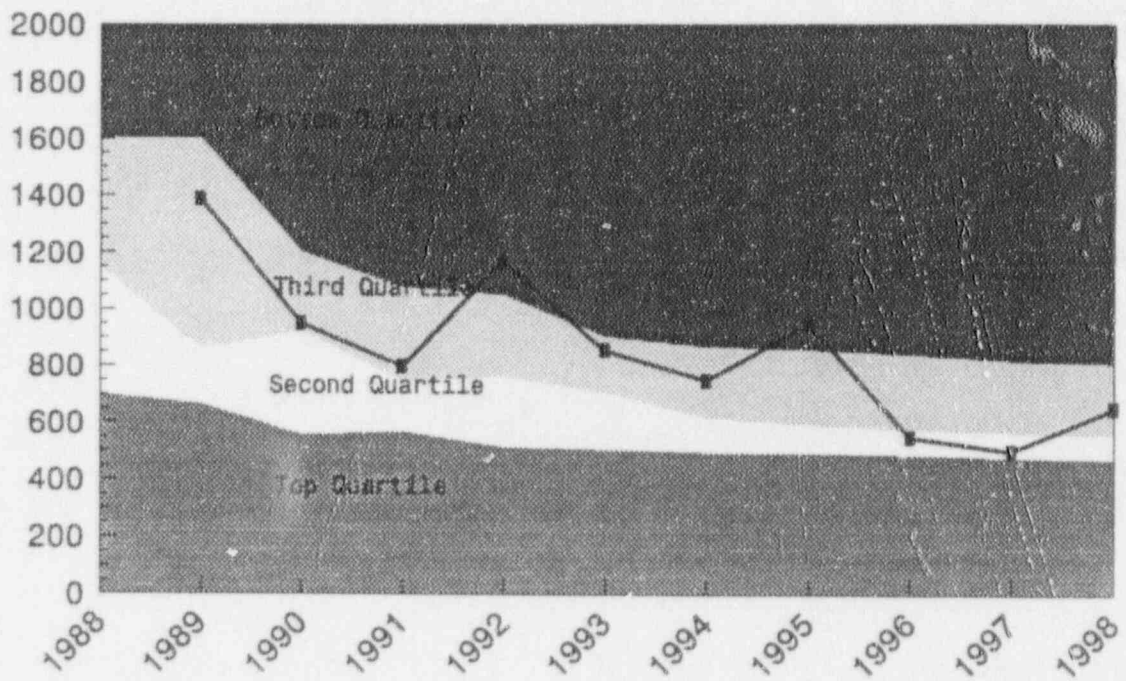
Techniques, Processes, Procedures and Training (continued)

- LaSalle Station will be implementing steps which are designed to improve radioactive material control. During the third week in April, the station will be redefining the Radiologically Protected Area (RPA) and will limit ingress and egress to two points, which will be continuously manned during outages. During non-outage times, the RPA will be further restricted by having only one exit, which will also be manned.

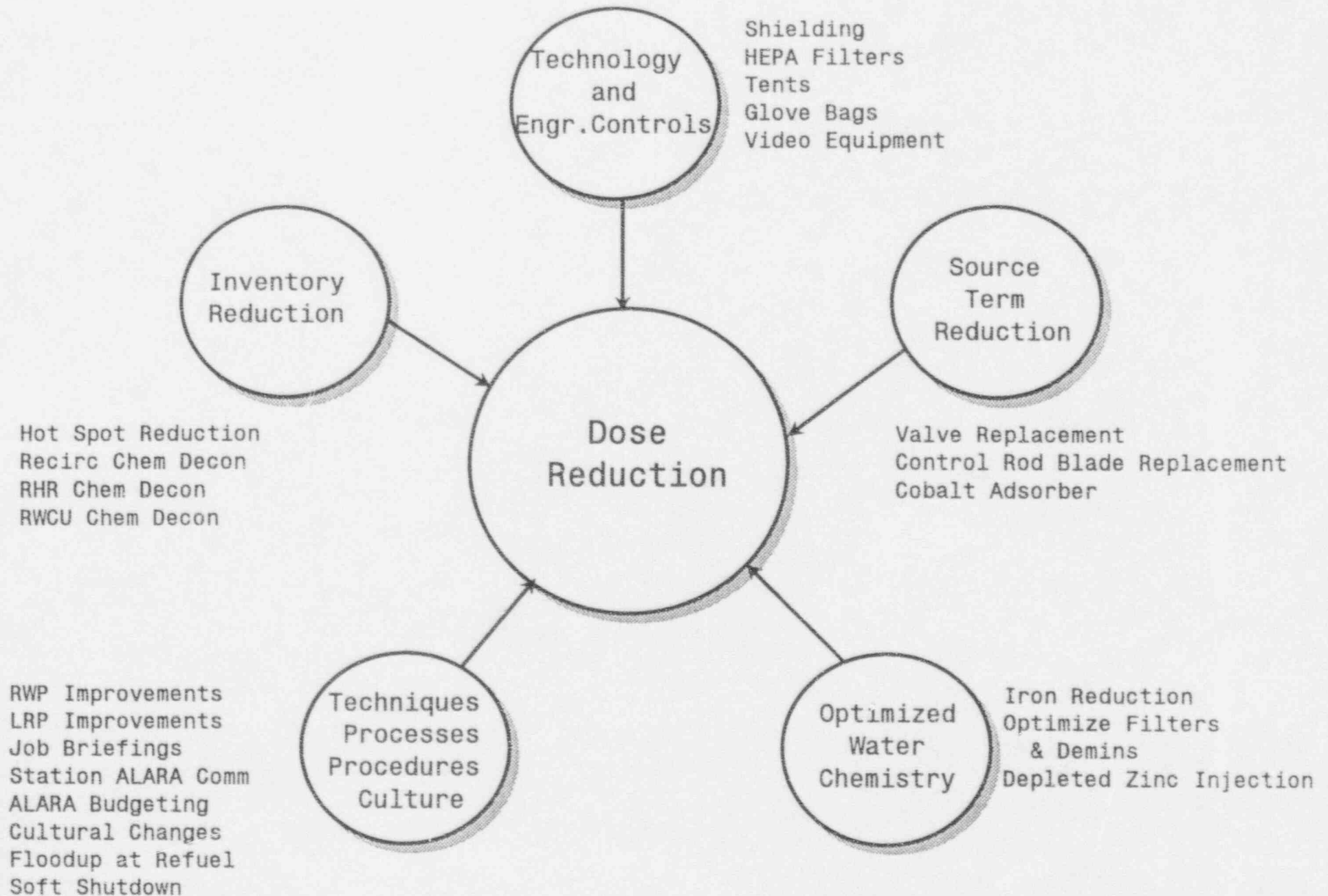
Additionally, the entrance to the RPA will be restructured to allow for a more positive control of personnel entering and exiting from the area. A dedicated individual will be positioned at the entrance of the RPA to challenge and observe individuals entering the RPA. This individual will have responsibility to ensure workers are aware of their RWP requirements, ensuring dosimetry control, and minimizing dry active waste. This program will be started by April 8, 1994.

- The Station ALARA committee is being reformattd. LaSalle personnel have been working closely with Byron Station ALARA representatives to restructure the content and focus of the committee. LaSalle's new ALARA committee will meet monthly, is chaired by the Maintenance Superintendent and includes representatives from various levels of the organization. The Station ALARA Committee works with the departments for ALARA goal setting, monitors progress toward goal achievement and reviews key jobs (such as the 1A RHR pump rebuild job) for exposure control.
- Steps are underway to improve radiological postings at LaSalle Station. The RPA is being re-surveyed in order to identify both low and high dose rate areas. Top priority was given to the outage unit, the plant has been resurveyed and "Low Dose Rate Area" signs have been placed on unit one. Additionally, many "High Dose Rate Area - Avoid Loitering" signs have also been installed. Surveys on unit two are underway. The department heads have been requested to brief their personnel on management's expectations to minimize time spent in high dose rate areas. These briefings will be conducted as part of the morning "tailgate" sessions conducted by most departments.
- The Station will be conducting refresher radiation training modules during L1R06. These modules will be given to contractor and station personnel. The training is designed to reinforce management's expectations regarding the adherence to rad rules and to refresh personnel on proper radworker practices and techniques.

LaSalle Station Radiation Exposure



Plant Dose Reduction Techniques



RAD WORKER CULTURE/ATTITUDE

- We have absolutely no question that the implementation of the Radiation Protection Program at LaSalle requires significant improvement. And that largely falls in the area of radiation worker performance. When we look at the problems we're experiencing with radiation worker performance, we are really looking at an organizational performance issue; a performance issue that is largely being driven by cultural defects and management shortcomings. We have a number of initiatives underway to improve management effectiveness and to make positive changes in our organizational culture.
- These initiatives to enhance management effectiveness will provide the needed performance improvement in the long term. We believe we're on the right track in this regard and are seeing evidence that some very positive changes are taking place in the culture (very small at this point but in the right direction). But it is no where near fast enough to meet our needs.
- We need to accelerate that culture change, beyond that which the long term initiatives are going to do. To do that, we've decided it is necessary that we conduct accountability and refresher training sessions for our radworkers (LaSalle employees and contractors alike).

These sessions are being designed to assist workers in improving their awareness and techniques for reducing personal exposure, avoiding common poor practices, and gaining a greater understanding of requirements. Additionally, there will be a focus on individual responsibility for following rules and applying good ALARA practices and the communication of a clear message that only the highest level of performance is acceptable. For those who choose to do otherwise, they will be held accountable. Duration will be about a half day with practical demonstrations of good and bad work practices. Opening and closing remarks will be delivered by station management. The real key will be the firm message on accountability. Those who find themselves unable to comply with the rules will be facing disciplinary action. These sessions are scheduled to begin next Monday April 11, 1994.

- Additional initiatives are ongoing to address the management and culture issues at LaSalle.

1. Management Involvement

LaSalle Station has implemented a Senior Manager On-Site Program that assigns Senior Managers and Department Heads to spend a full shift in the plant in an oversight capacity. The team works together to follow jobs in the field. This allows the two man team to coach workers on job activities, monitor performance, and provide management expectations. This oversight function provides Station Management with a first-hand idea of the problems encountered by the workers in the field, and allows us to be proactive in removing barriers. The Managers observe the workers' performance in such areas as radiological work practices, personnel safety, procedural adherence and housekeeping. Currently, this is a pilot program.

2. Communications

We are continuing to expand the various communication channels being used to make the worker knowledgeable of radiation rules and our standards and expectations for fully complying with those rules.

- Radiation Protection topics are published and discussed through both an RP Department publication and the station newspaper.
- We have significantly enhanced our efforts to build trust and teamwork work between the Radiation Protection Staff and the Radiation Workers. Radiation Protection Supervisors and Technicians have been assigned to work with a specific department and interact with the workers in that department on a continuous basis.
- We seize the opportunity to discuss Rad Protection and Rad Worker items of interest during the daily POD and Event Screening Meetings.
- Weekly Communication Meetings.

3. Accountability

- Station Management has established an informal policy to ensure accountability for poor radiation worker performance. Personnel contamination events and significant radiological incidents are reviewed with the worker, supervisor, and Radiation Protection Staff.
- Workers and Supervisors are being challenged to reduce the dose of specific jobs. This is fostering increased worker and line management involvement and accountability for dose reduction.

- The Station ALARA committee is being restructured. LaSalle personnel have been working closely with Byron Station ALARA representatives to restructure the content and focus of the committee. LaSalle's new ALARA committee will meet monthly, will be chaired by the Maintenance Superintendent and includes representatives from various levels of the organization. Bargaining Unit personnel will be invited to participate. The Station ALARA Committee works with the departments for ALARA goal setting, monitors progress toward goal achievement and reviews key jobs.

These are a number of the initiatives underway, designed to promote management involvement in the activities of the organization, to improve communications, to set expectations, and develop a culture of high standards and accountability.

ATTACHMENT 1

CONTAMINATION EVENT

APPARENT VIOLATION

Apparent deliberate contamination of radiation workers' clothing.

DESCRIPTION OF EVENT

- On 11/18/93, a female Radiation Protection Technician (RPT) performed work on the Refuel Floor (RFF) within the radiologically controlled area (RCA). Prior to entering the RFF, the RPT changed from her personal clothing into modesty garments and protective clothing (PCE).

The change rooms for the RFF are two small rooms (on the Unit 2 side) which are commonly shared by both male and female workers and are accessible to anyone who may gain access to either of the Unit Reactor Buildings.

- The RPT removed her personal clothing, folded, and stacked them on a bench in the change room with her hard hat on top of the stack. She entered the RFF and performed her duties for about 2.5 hours. She exited the RFF and entered a personnel whole body frisker. She had removed her PCEs before exiting the RFF and was wearing modesty garments when she entered the whole body frisker, received a "clear" indication on that monitor, and went to the change room. She removed her modesty garments and put on her personal clothing. While dressing, she noticed a brown smudge mark on the inside of her pants but at the time thought nothing of it. She then proceeded to the RCA exit point. While processing through the monitor, she received an alarm which indicated contamination on the rear area of her body. She proceeded to the decontamination room and discovered that the inside of her pants in the area of the smudge measured 25K dpm/100 cm². She subsequently measured her underwear and it exhibited 4K dpm/100 cm². Her skin did not display any contamination. She washed the contaminated areas of her clothing and exited the RCA.
- An investigation was initiated to determine how the contamination found its way onto her clothing. She was interviewed by Human Resources management to ascertain the possibility of sexual harassment. None was identified.
- During the initial stages of the investigation, a female Fuel Handler (FH) came forward with a description of a similar event which had occurred about a week before the RPT's, and also involved the FH's personal clothing.

- On 11/13/93, the FH was working on the RFF and had removed her personal clothing and placed them in the change room similar to that of the RPT's. She performed her tasks on the RFF and exited through the whole body frisker by the change room and received a "clear" indication. She donned her personal clothing and attempted to exit the RCA. She received an alarm while exiting. The monitor indicated contamination on the rear part of her body. She reported to an RPT in the area. Contamination was measured to be 5K dpm/100 cm². She did have some cross contamination to her skin but all indication of contamination was removed. The 5K contamination level is at the lower limit of detectability in which the monitors are calibrated. The RPT failed to document the contamination on a Potential Contamination Event Report.
- Upon learning of the second occurrence of what appeared to be a deliberate attempt to contaminate radiation workers, the investigation was expanded and included corporate security staff. This investigation included interviews of thirty-six people who were known to be on the RFF during the times of the two events.

The results of the interviews were inconclusive as to a potential perpetrator.

- A camera was set up to observe entries into the change room from 12/8-22/94, but this surveillance revealed no unusual activities.
- An investigation was subsequently performed to resolve some technical specifics regarding these events. The results of this investigation showed several possible scenarios which could have resulted in the contaminations. Even so, it does not appear that a more definitive conclusion could be reached.

REASON FOR THE VIOLATION

Apparent deliberate contamination by person(s) unknown.

CORRECTIVE ACTIONS

- Immediate Actions Taken
 1. The importance of promptly reporting contamination events so that an investigation can take place was reiterated with the Radiation Protection Technicians.
- Corrective Actions to Prevent Recurrence
 1. Prior to and as part of the outage kickoff for LIR06, events which had probable elements of tampering were reviewed with Station personnel.
 2. The Corporate review is being evaluated by the Station to determine any additional actions that need be taken to address other possible scenarios.
 3. It was reemphasized with the Event Screening Committee the importance of taking aggressive action when events with intentional acts are involved.

ATTACHMENT 2

SAMPLING EVENT

APPARENT VIOLATION

Failure to adequately evaluate radiological hazards during the collection of a radiological waste sample.

DESCRIPTION OF EVENT

- Radwaste Operators were processing water through the Chemical Waste Concentrator and needed to obtain sample results on the Unit 2 Chemical Waste Collector Tank.
- A Chemistry Technician (CT) attempted to draw the sample at the Unit 1 Turbine Building 663' elevation sample sink. The sample line was plugged. Radwaste shift personnel were notified.
- The Radwaste System Supervisor (RWSS) informed the CT that he and a Non-licensed Operator would attempt to unplug the sample line and, if successful, draw the sample.
- The line was successfully unplugged and the RWSS drew the sample (250 ml) in the sample bottle left by the CT. The sample bottle was placed inside a rubber glove for contamination control and the Operator proceeded to the Chemistry Lab.
- Upon reaching the exit from the Radiologically Protected Area, the IPM-8 Monitors and frisker began alarming and would not reset. A Radiation Protection Technician in the area had the Operator set the sample aside, obtained a dose rate meter, and determined the sample dose rate to be 2.5 R/hr at 2 inches.

The dose rate was significantly higher than normal due to an earlier equipment failure. Resin from a phase separator had been transferred to the tank during a dewatering process. A filter failed allowing waste to flow to a sump and subsequently to the Unit 2 Chemical Waste Collector Tank.

- Chemistry personnel were notified, transported the sample bottle to the Chemistry Lab, shielded the sample and roped it off.
- The Operator's digital dose monitor was set to alarm at 300 mR/HR and read 8mR for the day. The RWSS's digital dose monitor read 4mR for the day. The maximum exposed extremity dose was calculated to be 392 mR for the RWSS and 208 mR for the Operator.

CAUSAL FACTORS

1. A management deficiency exists in definition, dissemination, and enforcement of roles and responsibilities. This resulted in personnel performing tasks without the proper training and procedures. This factor is considered the root cause.
2. Supervisory methods were deficient in clearly specifying what duties were expected of the workers and that production did not take precedence over safety. Perceived pressures to complete ongoing activities as quickly as possible were apparent.
3. Radiological safety has not yet been demonstrated as a concern among worker in the plant. Poor practices included not having the proper equipment/information at the work site and not self-checking to ensure expected response.

CORRECTIVE ACTIONS

• Immediate Actions Taken

1. The plugged line was back-flushed and unplugged.
2. A Memo was written to Chemistry Personnel which:
 - instructed them to write a work request for future plugged lines
 - reminded them of their role in taking samples as the qualified individuals to perform this function
 - emphasized the importance of using good radiological practices
 - encouraged them to speak with other departments' personnel bringing in miscellaneous samples (i.e., mop water) about the potential radiological hazards and offer their services for sampling
3. The Station Manager met with the RWSS, Operator and Chemist to discuss the event and set expectations.
4. Radwaste personnel were instructed via daily work orders to not take samples or unplug sample lines.
5. Station personnel were briefed on the event during the Station Stand Down Meeting. Emphasis was placed on safety and good radiological practices taking priority over schedule.

• Corrective Actions to Prevent Recurrence

1. Instructions will be given to Radwaste personnel concerning job functions and allowable actions. This will be completed by April 30, 1994.

ATTACHMENT 3

CONCERN

During the NRC inspection interviews with several individuals led to the conclusion that Chemistry Technicians (CTs) do not always use survey meters when pulling samples from RW tanks which routinely do not exhibit radiation dose rates greater than 25 mR/HR.

DISCUSSION

Procedure LCP 310-02 "Sampling At Process Panels" cautions CTs that a survey instrument should be available to check dose rate from samples containing radionuclides. Based on craft capability, CTs do not routinely survey samples from process lines that radiation dose rates of less than 25mR/hr.

During our review of this event, we recognized that current practice must be changed to ensure the protection and safety of personnel.

ACTION TAKEN

Procedure LCP 310-02 "Sampling At Process Panels" was revised to require a survey meter be used to determine radiation dose rates during sampling of process lines that contain radioactivity.

Chemistry is working with Health Physics to identify dose rate meters that are most suitable for use by the CTs during sampling. Currently, a RAM GAM I is being field tested for use by the CTs.

*Radiation Protection Program
Improvement Initiatives*

*D. M. Farr
Technical Superintendent*

Radiation Protection Program Improvement Initiatives

▶ Problem Statement

- Rad workers are inconsistent in:
 - understanding and implementation of fundamentals
 - attention to detail
 - regard for rules, procedures and rad hazards
- Plant Source Term is high
 - contributes to rad exposures which are comparatively among the highest in the industry.
- Ineffective Management and Leadership are large contributors to the problem
- Causal Factors Include
 - inability to set and communicate clear expectations
 - standards of performance which are set too low
 - failure to hold supervisors and workers accountable for performance
 - ineffective resource utilization and allocation

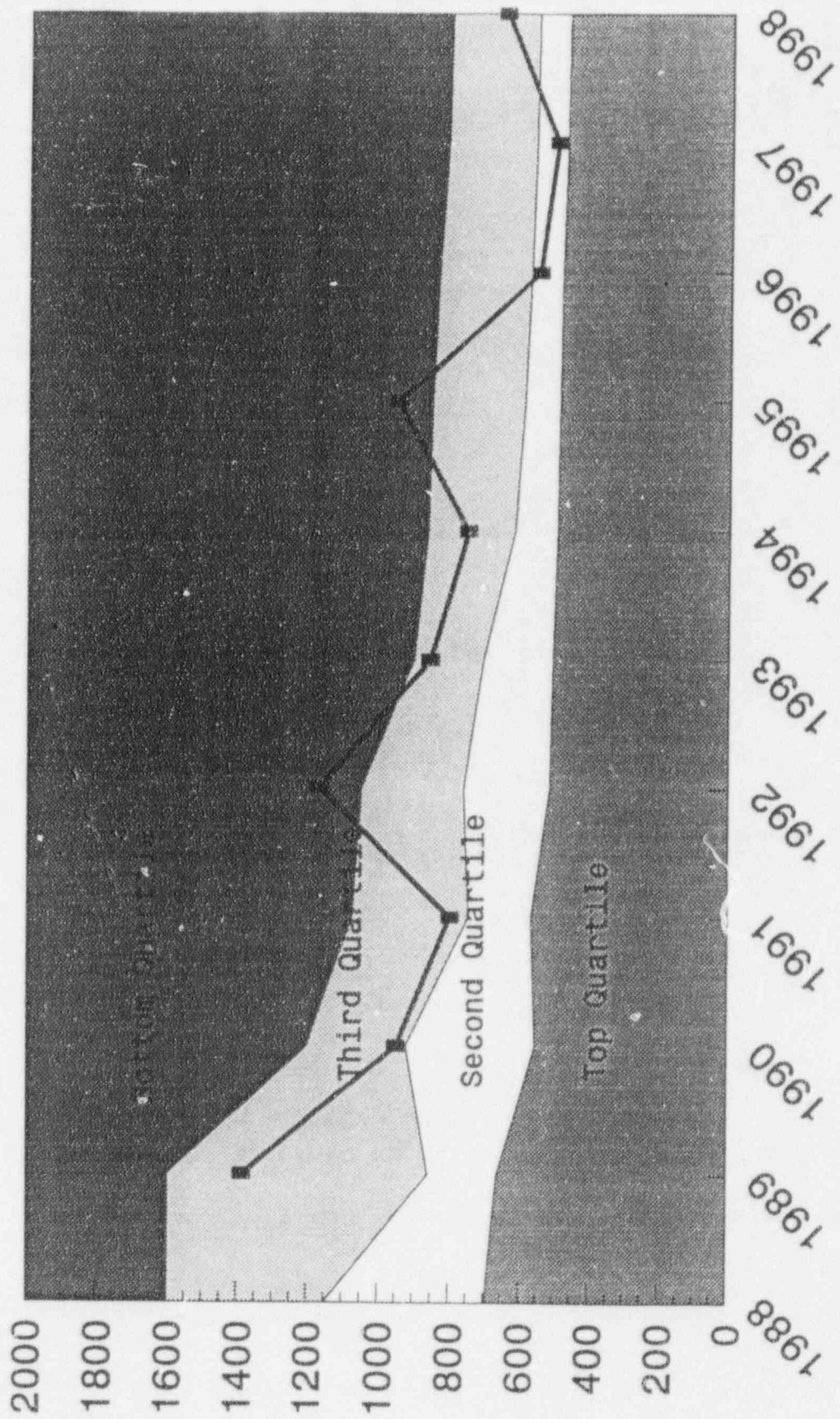
Radiation Protection Program Improvement Initiatives

- ▶ These causal factors have led to:
 - station workers receiving high collective dose
 - many workers who do not understand or respect the radiological hazard
 - many workers who are not rigorous in following food radiological work practices
 - a high percentage of the plant area which is radioactively contaminated
 - plant processes and controls which have not been fully effective at preventing radioactive material from leaving the RPA.

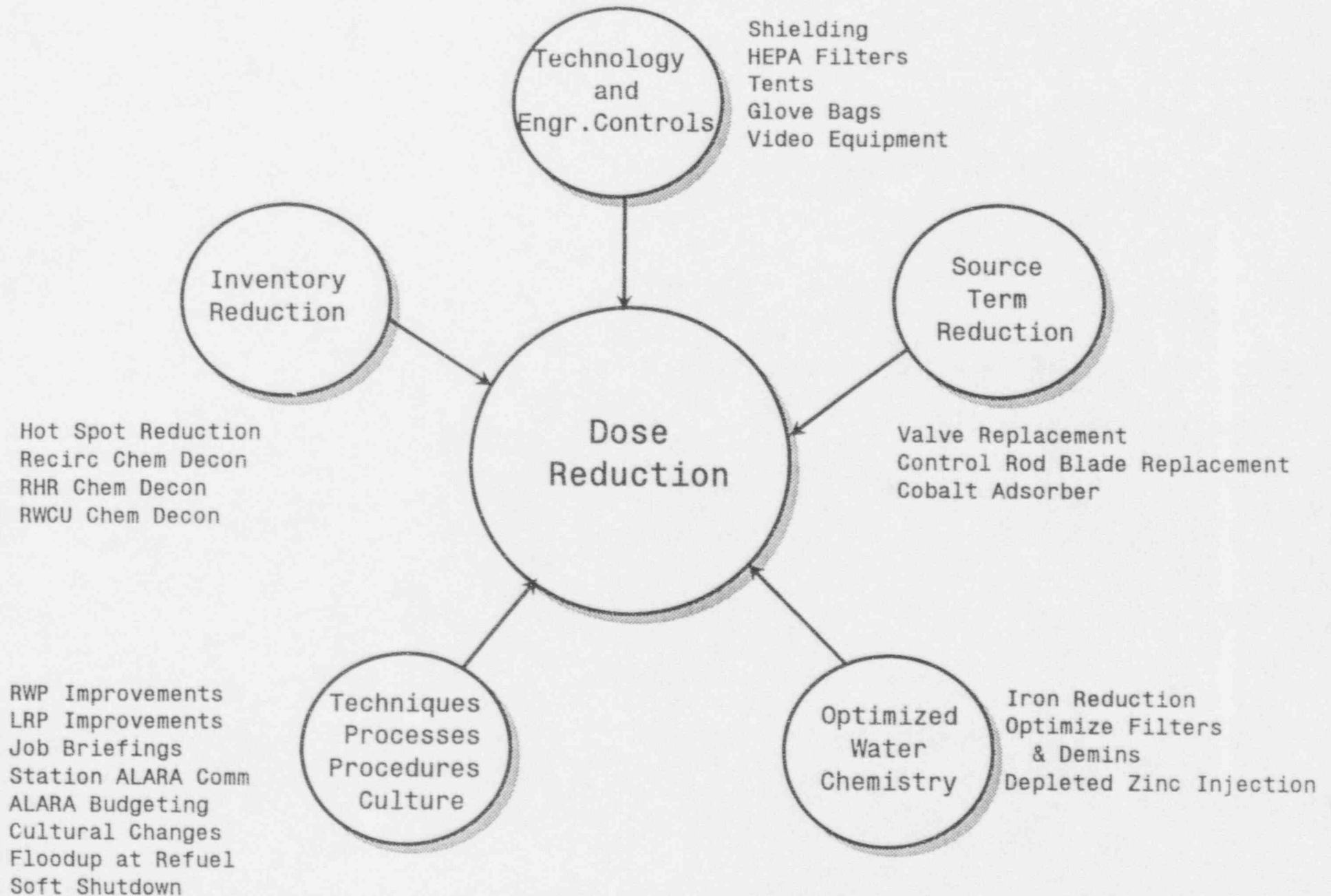
LaSalle's Vision of the Future
Radiation Protection

The Station's workforce has a high respect for the radiation hazard, and a fundamental knowledge of good radiation protection work practices which fosters an excellent radiation worker performance culture. The Station's ALARA and Source Term Reduction programs are effective, resulting in above average performance in controlling radiation exposures.

LaSalle Station Radiation Exposure



Plant Dose Reduction Techniques



Radiation Protection Program Improvement Initiatives

Techniques, Processes, and Procedures

- Initiatives which will result in near term benefits
 - Improvements involve changes to radworker techniques, processes, radiation protection procedures and radworker training.
- RP Procedure Improvement Initiative
 - Focus is to simplify and streamline procedures
 - Making procedures more effective and easier for the radworker to understand and comply with
 - Currently RWP program is being revised for clarity and ease of use
 - Development of standardized survey maps for content and layout
 - Development of a RWP summary page to provide all pertinent information for the radworker in one area of the RWP package
 - Byron personnel are assisting with our revision process
- Increased emphasis on intradepartmental communication
 - RP ALARA supervisors physically assigned and located in key work areas in the Operating and Maintenance Departments
 - Infusion of RP into the line organization
 - RP representative assigned to the L1R06 Work Control Center
 - Single point of contact (one stop shopping) for work control organization
 - Daily dose status, key radiological jobs, and RP informational articles are published in the Station Newsletter "STAR"
 - RP department publication "Just a minute"
 - Generated weekly
 - Discussion topics with RP focus for daily departmental meetings

Radiation Protection Program Improvement Initiatives

Techniques, Processes, and Procedures

- Radioactive Material Control
 - Redefining RPA
 - Limit ingress and egress to two points during outages
 - Limit ingress and egress to one point during non-outage
 - Continuously manned
 - Restructuring RPA
 - Positive control point to be established at two locations on 710
 - Position at "4-line" will be manned
 - Challenge and observe individuals entering RPA
- Improve Radiological Postings at LaSalle
 - RPA resurveyed to identify both high and low dose rate areas
 - Top priority given to Unit One (Outage Unit)
 - Many Low dose rate area signs placed
 - Many "High dose rate - Avoid Loitering" signs have also been installed
 - Department Heads are communicating expectations to minimize time spent in higher dose rate areas during their "Tailgate sessions".

Radiation Protection Program Improvement Initiatives

Inventory Reduction

- ▶ Initiatives focused on removing and reducing existing source term
 - Hot Spot Reduction Program
 - Fifteen hot spots targeted for L1R06
 - 10 person-REM savings estimated for 1994
 - Dose rate savings increase to 50 person-REM per year in 1996
 - Chemical Decontamination
 - Recirculation System Decon during L1R06
 - 200 person-REM savings estimated for 1994
 - L2R06 (Spring 1995) and L1R07 (Fall 1995)
 - Recirculation System Decon scheduled
 - 200 person-REM savings estimated
 - Engineering Evaluation for RHR and RWCU in progress
 - 25 person-REM savings for RHR
 - 10 person-REM savings for RWCU

Radiation Protection Program Improvement Initiatives

Optimized Water Chemistry

- ▶ Initiatives are focused at reducing the concentration of reactor water impurities before they become irradiated.
 - Iron Reduction
 - Iron transport is primary mechanism for migration of Co-60 to out of core surfaces.
 - Enhanced crud removal resin installed on six of the demineralizers on unit one.
 - The seventh demineralizer will be replaced prior to restart following L1R06
 - Corrosion coupons installed during L1R05 were removed this outage for analysis of high erosion/corrosion areas of the main condenser.

Radiation Protection Program Improvement Initiatives

Optimized Water Chemistry

▶ Depleted Zinc Injection

- Zinc and Cobalt compete for the same oxidation sites on the inside surface of the stainless steel piping. When zinc is present in the reactor water at 5 to 15 ppb, the corrosion films formed on both the piping and fuel are thinner and more tightly adhering. This results in a larger percentage of the cobalt remaining on the cladding of the fuel rods where it can be ultimately discharged.

- Temporary skid mounted system operational February 1994
 - Permanent skid to be installed in September 1994
- Unit two will begin operation in January 1995

- Use of depleted zinc augments chemical decontamination process by ensuring that cobalt buildup occurs at a substantially rate.
 - Estimated dose rate savings is 141 REM following first cycle of operation.
 - Estimated dose rate savings is 226 REM following three cycles of operation.

Radiation Protection Program Improvement Initiatives

Source Term Reduction

- Cobalt 60 is largest contributor to dose at LaSalle
- Control Rod Blade (CRB) Changeouts
 - Stellite pins and rollers are largest contributors
 - As blades reach the end of their useful life, they will be replaced with non-stellite components.
 - 15 CRBs are being changed out during L1R06
- Valve Replacement
 - Identified top "stellite valves"
 - prioritized into three categories
 - Priority I valves
 - Principal cobalt contributors
 - Will be replaced with non-stellite components whenever valve maintenance or plant modification warrants.
 - Priority I valves will either be stocked on the shelf or will be ordered, if lead times are sufficiently short
 - Priority II valves
 - Those valves that contribute to a lesser degree to the plant's cobalt concentration
 - Generally are those valves NOT in the reactor coolant flow
 - Replacement will be done on a case-by-case basis
 - Parts would not normally be stocked for these valves
 - Priority III valves
 - Valves not wetted by the reactor coolant system
 - Presently no plans to replace priority III valves with non-stellite components.

Radiation Protection Program Improvement Initiatives

New Technology and use of Engineering Controls

- Initiatives in this area include the enhanced use of video equipment and robotics and the more extensive use of engineering controls during radiation worker activities
- Video tour program
 - Computer based video program that could be used as a dose reduction tool for engineering, maintenance and training evolutions
 - Program allows for tour of the rad areas from computer console
 - Evaluating feasibility of filming for this program during 1995 when access to both units' drywell would be available
- Access Control Program
 - Computerized system to replace existing system
 - Allows for direct communication to individual workers or groups of workers
 - Provides ability to lockout access for key requirements that have not been fulfilled by the workers.
 - Implementation is scheduled for Fall 1994

Radiation Protection Program Improvement Initiatives

New Technology and use of Engineering Controls

- Wireless Remote Monitors
 - Expanded use of monitors
 - Used during L1R06 Chemical Decontamination
 - Dosimetry remotely located on various pipes and equipment
 - Precludes HP techs from having to make drywell entries for surveys

- 1A RHR Pump Rebuild
 - Emergent Scope for L1R06
 - Original Projection: 27 person-REM
 - New Projection: 12 person-REM
 - Technology/Engineering Controls Included:
 - Detailed project planning, incorporating projections by job component
 - HEPA filters during disassembly/reassembly
 - CAM monitors during entire work
 - Bead blaster decontamination of parts immediately following disassembly
 - Underwater parts storage at job site
 - Hydrolazing of pump casing and internal parts
 - Use of tents for contamination control
 - Use of remote camera equipment for surveys/inspections

- Byron Robotics Seminar
 - LaSalle personnel to attend seminar, hosted by Byron, in April
 - Obtain understanding of current technology and explore new ideas for robot usage

Female Worker Contamination Events

- On 11/18/93, a female RPT who was working on the refueling floor, was found to be contaminated upon exiting the RPA.
 - Inside of her pants measured 25K dpm/100cm².
 - The outside of her underwear was measured at 4K dpm/100cm².
 - Her skin did not display any contamination

- On 11/20/93 a female fuel handler came forward stating that she had been contaminated on 11/13/94. She had also been working on the refueling floor
 - Inside of her pants measured 5K dpm/100cm²
 - Her skin was contaminated at a level that prevented entry through the portal radiation monitor (approximately 3K dpm/100cm²)

- Causal Factor:
 - Apparent deliberate contamination of female radiation workers' clothing

- Immediate Corrective Actions:
 - The importance of promptly reporting contamination events was re-emphasized to the RPT

- Corrective Actions:
 - The Station Manager communicated, during L1R06 outage kickoff meeting, his expectations regarding events which had probable elements of tampering.
 - The Station Manager re-emphasized with the Event Screening Committee the importance of taking aggressive actions when intentional acts are involved.

Chemistry Sample Event

- On February 22, 1994 a Chemistry Technician and a Radwaste Operator failed to properly evaluate radiological hazards when the Radwaste Supervisor and operator unplugged and obtained a sample. The sample was later determined to be reading 2.5 R/hr at 2 inches.
- Causal Factors
 - A management deficiency existed in definition, dissemination and enforcement of roles and responsibilities. This resulted in personnel performing tasks without proper training and procedures.
 - Supervisory methods were deficient in stating expectations on job performance standards.
 - Workers did not have proper respect for the radiological hazard.
- Corrective Actions:
 - Expectations were given to Chemistry Personnel in the form of a departmental memo
 - Write work requests for future plugged lines
 - Re-emphasized their role with regard to monitoring dose rates while samples are being obtained
 - Emphasized the importance of using good radiological practices
 - The Station Manager met with the RWSS, Operator and Chemist to discuss the event and set expectations
 - A Operating Daily Order was issued to all radwaste personnel communicating expectations
 - Station personnel were briefed during a station stand down meeting on February 25, 1994

Chemistry Sample Event

- Evaluator Comments
 - LaSalle Chemistry technicians do not always use survey meters when obtaining samples which could be potentially radioactive
- Causal Factors
 - LaSalle procedure LCP 310-02 "Sampling at Process Panels" cautions CTs that a survey instrument SHOULD be available to check dose rates from samples containing radionuclides. Supervisory expectations were not clearly communicated to the CTs.
- Corrective Actions
 - Procedure LCP 310-02 was revised to REQUIRE a survey meter to be used when obtaining samples that are potentially radioactive.
 - The Chemistry Supervisor has held "tailgate" sessions with the CTs instructing that survey instruments would be used at all process sample panels containing radionuclides