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NOVEMBER, 1990

# FEDERAL FACILITIES COMPLIANCE AGREEMENT

## CHROMIC ACID INCIDENT PLAN AND IMPLEMENTATION SCHEDULE

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28 PGS.

REVIEWED FOR CLASSIFICATION/UCNI	✓
BY <u>G. T. Ostdiek</u>	<u>630</u> ✓
DATE <u>8-18-93</u>	

 **EG&G ROCKY FLATS**

ADMIN RECL. 41

ROCKY FLATS PLANT

DATE 11/13

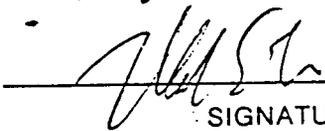
TO	FFCA IP Reviewers	DEPT.	—	BLDG.	✓
FROM	MARK LEVIN	DEPT.	ER	BLDG.	T130B
				PHONE	x4237

MEMORANDA

"SAY IT IN WRITING"

MESSAGE: This draft represents the melding of review comments from numerous EG+G reviewers of the Nov. 1 draft, together with DOE comments received to date and new text added as a result of attempts to verify actions/closures of several findings. FINAL DRAFT IS DUE TO EPA ON NOV. 15!

(PAGINATION / SPACING CHANGES ARE IN PROGRESS)

  
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## CHROMIC ACID INCIDENT PLAN AND IMPLEMENTATION SCHEDULE

### SUMMARY

This plan has been developed in response to the NPDES Federal Facility Compliance Agreement (FFCA) between the Department of Energy and the Environmental Protection Agency. The FFCA requires a plan and implementation schedule, as necessary, to address the findings in sections 5.4 (Judgement of Needs) and 5.5 (Other Areas of Concern) of the "Report of the Chromic Acid Incident Investigation at Rocky Flats - February 22, 1989" which was prepared by a DOE investigative board convened as a result of an incident where a tank overflow resulted in the unplanned release of dilute chromic acid solution from the Building 444 Plating Laboratory to the plant's sanitary waste system and on-site holding ponds.

The findings of the board vary in scope from issues which can be resolved by minor administrative or operational changes to findings with plantwide impact which will require significant planning, manpower commitment, and funding. Certain findings are open-ended in that they require assessments of operational conditions, with the likelihood that additional deficiencies requiring corrective action will be identified as a result.

The status of the actions to resolve the findings varies as a result of the wide range of scope. Some have been completed, others are in progress or in detailed planning or design stages, and some are awaiting determination of scope, schedule, or funding. In some instances, the Plant's new Management and Operating (M&O) contractor, EG&G, has made the determination that a more comprehensive set of actions is needed for closure of a particular DOE investigative board report finding than the actions taken by the previous contractor in response to its internally developed corrective action plan: this rescoping and, in some cases, reworking accounts for the number of findings still open. This plan summarizes the status of completed and ongoing actions, with schedules for their completion, as appropriate. For certain findings, where plans for large scale activities are still being developed, this document presents tentative scope and schedule information to the extent it has been developed for these items, which is put forth for EPA review.

In some cases, subsequent evaluation of the overall strategy for controlling unplanned releases of hazardous substances at Rocky Flats has identified potentially more cost effective means of addressing the concerns raised by the board than those means implicit in the report's specific findings. For example, due to the aging condition of the equipment in the Building 444 Plating Laboratory, the Plant's Engineering department has found it to be more appropriate to replace the entire Plating Laboratory involved in the incident than to attempt to implement upgrades piecemeal.

A similiar area is the set of findings related to containment, where the provision of more barriers between potential contaminants and the environment, including possibly a limited zero discharge implementation, permanent isolation of the plant's discharges from adjacent drinking water supplies, and/or the construction of source control barriers in certain zones might be a more effective use of available manpower and budgetary resources than a building-by-building and room-by-room assessment and upgrade program for all drains, tanks, berms, and pipes. It is possible that this approach might yield a greater risk reduction, as well.

In light of this, DOE and EG&G anticipate input and review from EPA staff during the development of detailed scopes for the resolution of those findings which could lead to major projects in order to ensure that the proposed corrective actions meet the intent of the FFCA.

## Judgements of Need

The Judgments of Need and Other Areas of Concern, based on findings generated by the investigation, and appearing in the investigation report by DOE, are listed below. Status of each as of October 31, 1990 is described, together with currently planned actions for those findings not yet fully addressed.

**"1. A need exists to resolve the split management role and activities in the Plating Laboratory and assign a single line of responsibility for safety, maintenance, and training."**

**Status:** The Plating Laboratory involved in the incident (Room 245) has subsequently been shut down, rendering this finding moot as it relates specifically to that facility. A detailed plan for the stripout of the laboratory and its eventual replacement is being developed.

While the detailed plan for stripout of the laboratory is still being developed, all electrical, water, and steam utilities to equipment that will be removed have been locked out to prevent any usage of the Plating Laboratory.

The stripout and replacement of the Plating Laboratory will require formulation of design criteria, completion of a formal Engineering department Scope and Estimate, funding, design, and construction of a replacement facility in order to maintain plant capabilities. The plan proposed by the Plant's Coatings Technology organization would integrate a variety of coating operations, including electroplating, into one facility. The Rough Order of Magnitude (ROM) estimate for the funding required to accomplish this project is currently \$10-12 Million.

When the new facility is constructed, the management structure will be critically examined by DOE and the M&O contractor with an eye toward eliminating split management responsibilities.

**"2. A need exists for retraining of the Building Manager and other supervisory personnel performing operations in Building 444 as to specific responsibilities for safety, maintenance, and training requirements."**

**Status:** Both the Building Manager and the supervisory personnel have been retrained with regard to their safety, maintenance, and training responsibilities.

"3. A need exists in the Plating Laboratory to resolve the level sensor problem and provide appropriate alarms. A distinction should be made between operating status signals and those alarms indicating a potentially hazardous situation."

Status: This finding has been rendered moot by the Plating Laboratory closure, as the finding relates specifically to that facility.

Prior to the permanent closure of the Plating Laboratory, the Plant's Control Systems Development (CSD) group evaluated the failure of the level sensor. The CSD group found that the problem which contributed to the Chromic Acid Incident was a result of the improper application of a capacitance type probe in a plastic tank, causing inaccurate readings. The CSD group also evaluated the alarm system and instrumentation, and found the system to be obsolete and in need of extensive upgrades.

When a new Plating Laboratory is constructed to replace the shutdown facility, modern process control and alarm systems will be utilized. The design and installation of alarm systems for the new facility will be to current standards, which will ensure that the concerns in this finding are addressed. No schedule for replacement of the Plating Laboratory has been developed as of this date.

"4. A need exists to assure the automatic control system for adding makeup water to plating and rinse tanks is properly maintained and calibrated."

Status: This finding has been rendered moot by the Plating Laboratory shutdown, as the finding relates specifically to that facility.

Appropriate equipment and procedures will be employed when the replacement facility is constructed. No schedule for replacement of the Plating Laboratory has been developed as of this date.

"5. A need exists to upgrade the Building 444 Safety Analysis Report from draft status to reflect operations with non-radioactive hazardous materials and consequences of release to the environment."

Status: DOE and EG&G believe that the need for a separate Safety

Analysis Report (SAR) for Building 444 must be superseded by the need for an updated SAR for the entire Rocky Flats site, including all buildings and operations. Another consideration is that the plating facility, where the spill originated, will now be removed from Building 444. Nevertheless, to comply with the specific FFCA requirement, EG&G will select Building 444 as the first building to be analyzed with a new process oriented evaluation technique, and this analysis will be documented in a report entitled Qualitative Basis for Safe Operations in Building 444. We request that this report be accepted instead of a formal separate Building 444 SAR.

The limited probabilistic methodology used in the development of the Building 444 draft SAR was incapable of anticipating the event that actually occurred. To identify such process-related accidents, the chemical process industry has developed the Hazards and Operability Study (HAZOPS) technique. This methodology has been proven, and is widely accepted in the chemical industry. It has not yet been applied to DOE nuclear process facilities, due to the traditional use of probabilistic risk assessment (PRA). However, unlike traditional PRA methodology which starts with predetermined potential accidents, the HAZOPS technique focuses on a systematic identification of hazards associated with process operations. This systematic screening technique provides a necessary element of safety analysis. As such, the Plant intends to use process safety analyses as an important element of analyses performed for the planned sitewide SAR.

Development of the sitewide SAR is a significant task which will require many years to complete. As reflected in the existing resumption plan, the majority of this effort will be performed after resumption of plutonium operations at the Plant.

While the highest priority for new safety analysis evaluations is on the plutonium buildings, we recognize that an adequate basis for safe operations in Building 444 must be documented. EG&G's Nuclear Safety (NS) Facility Safety Engineering (FSE) group proposes to address the specific needs for Building 444 operations, and a small portion of the overall RFP site SAR through development of a Qualitative Basis for Safe Operations in Building 444, which will be used to serve as a temporary document in support of Building 444 operations, pending completion of the sitewide SAR. This document will be provided as a deliverable of this NPDES FFCA task.

Development of the Qualitative Basis for Safe Operations in Building 444 will be performed using staff from FSE and staff experienced with Building 444 operations. Each process safety review will be conducted by a team consisting of a team leader, scribe, and personnel experienced in the operation under review, including an operator, engineer, and other staff as appropriate.

Two process review teams will work in parallel to address all processes in Building 444. Each team will apply an appropriate analysis technique (most likely HAZOPS unless another technique provides significant benefits). Depending on complexity, it is expected that each team will require approximately three days for detailed review of each process. Processes which will be reviewed include: Metallurgical Operations, Machining Operations, Assembly Operations, Inspection Operations, Nondestructive Testing Operations, and Support Operations.

Following process safety analyses of the various key functions of the facility, the two FSE staff will perform bounding safety analysis of the overall facility using results of the process safety analysis to define challenges to the building containment systems. This will allow the analysis to address impacts to workers, the public, and the environment.

The schedule for this effort requires 26 weeks. A one week training period is required for the four FSE staff who will be conducting the process safety analyses. At the discretion of the Building 444 Manager, selected Building 444 staff will also attend the training. Assuming continuous participation of project staff, if this effort will begin in August, 1991, and will be completed by February, 1992. Time required to schedule the specialized hazards analysis training may impact this schedule.

**"6. A need exists to update the Operational Safety Analysis specific to Plating Laboratory Operations for both Development and Production operations with Limiting Conditions to be included in the operating procedures."**

**Status:** This finding has been rendered moot by the Plating Laboratory shutdown, as the finding relates specifically to that facility.

Prior to the decision to shutdown the Plating Laboratory involved in the Chromic Acid Incident, Operational Safety Analysis (OSA) 444.03 was updated and reviewed to cover this concern. New OSAs specific to the operation of the replacment facility will be written as needed when the new facility is constructed, and Limiting Conditions will be included in the appropriate operating procedures. As of this writing, no schedule for the construction of the new facility has been developed.

**"7. A need exists to have formal operating procedures in the Plating Laboratory for both development and production operations. The procedures should include end-of-shift inspection."**

**Status:** This finding has been rendered moot by the shutdown of the Plating Laboratory, as the finding relates specifically to that

facility.

Prior to the decision to shutdown the Plating Laboratory involved in the Chromic Acid Incident, the following actions had been taken to address this Judgement of Need:

A. The operating procedures for electroplating processes were reviewed by the relevant managers, and changes to the procedures were submitted to the plant's Technical Writing group;

B. A procedure that defines response to alarms on the alarm panel in the Plating Laboratory was written, approved, and posted;

C. Plating Laboratory personnel were instructed to visually check the alarm panel at the end of the shift as part of the overall securing of the laboratory.

Formal operating procedures, including appropriate provisions for an end-of-shift inspection, will be developed for the replacement facility after its construction. As of this writing, no schedule for construction of the new facility has been developed.

"8. A need exists to assure proper indoctrination for alarm conditions is provided to transient personnel (e.g., craftspersons) performing work in the Plating Laboratory. This is especially appropriate on off-shift when no Plating Laboratory personnel are present."

**Status:** This finding has been rendered moot as a result of the shutdown of the Plating Laboratory, as the finding relates specifically to that facility.

Prior to the decision to shutdown the Plating Laboratory involved in the Chromic Acid Incident, the following actions were taken in response to the finding:

A. Signs which identify action to be taken in the event of alarm activation were posted on all Plating Laboratory alarms, and on the alarm panel;

B. The content of the formal building indoctrination was revised to cover alarm response. Plant policies require that persons without building-specific indoctrination be escorted while in a production building.

"9. A need exists to assure alarm situations are recognized and appropriate notifications made. Security guards on watchtours and other off-shift personnel are likely to encounter such situations."

**Status:** The plant has implemented a new employee training program, known as General Employee Training (GET). The GET curriculum is being revised to include instruction on alarm response. All existing and newly hired employees are required to attend this course. The revised curriculum will go into effect on January 1, 1991.

"10. A need exists for those alarms which indicate a potentially hazardous situation to personnel or to the environment be monitored on a 24-hour basis."

**Status:** In response to this finding, a task team consisting of four instrumentation and control systems engineers investigated general plant alarms from June 1989 until September 1989. This evaluation concluded that fire detection, Selective Alpha Air Monitors, criticality, and security alarm systems were adequately designed, maintained, and monitored by qualified personnel, but that process and utility alarms were not.

As a result of the initial investigation, a project to survey all process and utility alarms was begun in October 1989. Twenty-one different teams were formed to survey and determine the adequacy of process and utility alarms in 42 buildings. Their report, entitled "Final Report-Adequacy of Process and Utility Alarms at Rocky Flats" was issued for plant review in March of 1990.

The report identified a total of 1002 process and utility alarm points at the Plant that are inadequately alarmed or not alarmed at all. The report's recommendations were:

"1. Existing process and utility alarm points needing repair or upgrading, and process and utility parameters needing alarms, should be prioritized based on the probability and consequences of a failure and then corrected".

An evaluation of the alarms is underway as part of the pre-resumption assessment. Alarm points will be classified into two categories: (a) Vital Safety System (VSS) alarm points required to be in operation prior to resumption, and (b) other process and equipment alarms. All alarms on Vital Safety Systems in plutonium buildings will be in place, operable, and functionally tested prior to resumption of plutonium operations.

All other process and utility alarm points not currently alarmed will be evaluated with one of the following dispositions:

A. Appropriate alarm(s) will be installed, proved, and the monitored equipment placed back into service;

B. The equipment will be locked out and an alarm system will be installed prior to operation of the equipment or system;

C. The process or utility point will be temporarily monitored administratively until alarms are installed or the equipment is taken out of service;

D. A determination is made by the relevant Operations Management that an alarm is not required, and the appropriate safety, technical, and environmental disciplines concur.

During this process, Engineering Job Orders or Maintenance Work Requests (EJO) will be initiated to make the upgrades and corrective actions indicated.

An EJO has been submitted to obtain an Engineering department Scope and Estimate to more accurately determine the level of funding which will be required to provide 24-hour central monitoring of process and utility alarms (Central Plant Alarm Station). After the Scope and Estimate is completed, funds will be requested to begin design and construction. At this time it is expected that a new building may be required to house the alarm station, and that total funding needs for the necessary alarm upgrades and 24-hour monitoring may exceed \$17 Million.

In addition to identifying numerous problems with specific alarms and alarm points, the report also identified deficiencies in:

- design and documentation practices;
- ownership/responsibility for process alarm installation, monitoring, repair, testing, and maintenance;
- availability of training and qualified personnel to install, repair, test, and maintain process and utility alarms;
- lack of written response procedures.

As a result, the team made the following additional recommendations for corrective action:

**"2. The use of industrial instrumentation standards should be required for all future designs of alarm systems.**

3. A sensor test facility should be established to develop, select and standardize on appropriate instrumentation for unique process and utility applications.

4. A dedicated organization with responsibility for design and documentation of all process and utility alarm systems should be established. ....

5. A single organization should be responsible for installing, repairing, performance testing and maintaining all process and utility alarm systems.

6. Equipment or process users should be responsible for safe and proper operation of the equipment or process, correct response to alarm conditions, continuous monitoring of alarm systems and alerting building and operations management and Maintenance of improper operation of sensors and alarms.

7. Building and operations management should be responsible for immediately disabling, tagging and prohibiting use of any equipment or process whose alarm system is found inoperable.

8. A dedicated group of Instrument Technicians should be established within the Maintenance organization. They should be properly staffed and trained to install, repair and maintain process and utility alarm systems. ....

9. A project team should be established to formally write and implement process and utility alarm response procedures at RFP based on the Institute of Nuclear Power Operations, INPO 85-003 "Alarm Response Procedures Development and Review Guidelines".

10. Operations personnel should be periodically trained and tested to pertinent procedures before they assume responsibility for equipment or a process. Operations personnel should also periodically practice their response to these procedures. ....

11. Process and utility alarm systems should receive Engineering and Maintenance support similar to that received for Fire, Health Physics and Security alarm systems."

The report estimated that to implement the suggested corrective actions an additional 44 Instrument Technicians and 20 engineers would be needed as a permanent addition to the plant workforce, that engineering support services such as reproduction would need additional support, and that approximately 14,000 man-hours would be needed to write response procedures.

Present efforts to address the alarm system report's recommendations center around prioritizing the needed upgrades to the actual alarms prior to resumption of plutonium operations.

DOE and EG&G management are still in the process of evaluating the additional recommendations. The ultimate actions may adopt the suggestions implicit in the recommendations or may address the basic concerns via other means. We will notify EPA of the Plant's planned actions in response to the foregoing recommendations.

**"11. A need exists to provide an adequate roof over Room 9A to accommodate equipment removal and provide protection from the elements."**

**Status:** The roof was repaired in August 1989. Final closeout inspection was performed November 1, 1989.

**"12. A need exists to review the emergency exit routes from the basement of Building 444, especially the auxiliary exit through Room 9A via the ladder next to the cyanide waste tanks."**

**Status:** Upon further review of this Judgement of Need, DOE and EG&G feel that the auxiliary exit in Room 9A was incorrectly questioned at the time of the investigation. Apparently, the investigative board believed that this exit was locked. In fact, it is not possible to lock the exit in question since no locking device exists on the door.

In the course of internal closure validation of this finding for this FFCA, EG&G's Performance Assurance and Environmental Restoration organizations initiated a request to the Plant's Fire Department for a formal review of the Building 444 basement, including the exit routes, exit route markings, and the ladder access door from Room 9A. On October 31, 1990, the Fire Department made the following findings, based on the National Fire Prevention Association (NFPA) Life Safety Code and Plant policies.

1. Exit route review:

a) North stairway by column G-7: Louvers in the exit enclosure, above the fire door, must be removed.

b) North stairway by column G-7: stairway must be enclosed.

2. Exit route markings:

a) Rooms 9A and Room 11: need yellow floor striping to mark exit routes and arrows leading to the exit.

b) Room 11 across from Column F-13: move exit light up twelve inches for better visibility when exiting Room 9A.

3. Review of Room 9A ladder access door:

a) The door at the top of the ladder inside Room 9A is to be used for an emergency secondary exit only. This door is not padlocked.

b) No more than 3 people at a time are allowed in the area.

c) Three inch letters are to be painted on the roll-up door with the following message: "THIS DOOR TO REMAIN OPEN WHEN OCCUPIED".

d) The exterior of the emergency fire escape hatch and surrounding area must be marked with a sign stating: "EMERGENCY EXIT DO NOT BLOCK".

e) The exterior of the hatch must be painted yellow.

The Building 444 Operations Manager has initiated "Urgent" priority Maintenance Work Requests to correct these findings. These have not yet been scheduled. We will notify EPA when the inspection findings are corrected.

**"13. A need exists to assure no cross connection exists between the acid waste tanks and the cyanide waste tanks."**

**Status:** The piping and plumbing systems for the plating waste tanks have been modified to eliminate any possible potential for a cross connection. This situation was corrected prior to the release of the investigative report, as stated on page 134 of that report.

**"14. A need exists for all building management and supervisors to review maintenance requirements and establish appropriate priorities for ESH [Environmental, Safety, and Health] type work and related work."**

**Status:** New oversight procedures have been put into effect to improve management of work requests. Procedure MPM 3.05, promulgated February 19, 1990, entitled "Maintenance Work Control"

System", sets the priority system for all Maintenance Work Requests (MWRs) throughout the plant. It defines all work with safety or environmental implications as either "Emergency" or "Urgent", which are the highest two priority categories. Health and Safety procedure HSP 2.07, promulgated April 22, 1990, entitled "Health and Safety Work Request Priority System", requires that the appropriate Health and Safety Area Engineer review all MWRs on a daily basis and indicate those which are safety related.

**"15. A need exists for periodic review of maintenance work orders and conditions in the Plating Laboratory and other areas requiring maintenance by Building and Operating management."**

**Status:** The procedures referenced above for Judgement of Need Number 14 also address the responsibilities of the various parties involved in the work order (MWR) planning and scheduling process throughout the plant. Specifically, HSP 2.07 requires that the appropriate Operations Manager, with the support of the Maintenance Department, ensure that the work is scheduled in a timely manner.

Additionally, with respect to Building 444, a Monitor Watch system of daily inspections has been implemented to ensure that management is aware of conditions throughout the building.

**"16. A need exists to review the Colorado Department of Health RCRA inspection report of August 1988 to ensure that their recommendations will be addressed in a timely manner."**

**Status:** There was no Colorado Department of Health (CDH) RCRA inspection report of August, 1988. The inspection report was dated July 25, 1988. The Plant's previous Management and Operating contractor, Rockwell, responded to DOE regarding the findings of the inspection in a letter dated August 9, 1988. After internal verification, DOE responded to Mr. David C. Schelton of CDH in a letter dated October 3, 1988, which addressed each of the concerns. A courtesy copy of the letter to CDH was sent to R.L. Duprey of EPA.

**"17. A need exists to assure integrity of primary liquid containment structures. The need for a leak detection sensor for these structures in the secondary containment with appropriate monitoring capability should be reviewed."**

**Status:** As an immediate action in response to this finding, all tank systems (primary liquid containment structures) containing hazardous substances and their secondary containment structures were examined for visible deficiencies. Those visible deficiencies have been corrected or have been scheduled for correction. In addition, a liner was installed in the secondary containment berm around the plating waste tanks in Room 9A of Building 444 and an alarm was installed to indicate filling of the bermed area.

This area of concern had been identified by a Technical Safety Appraisal (TSA) inspection team prior to the release of the DOE report on the Chromic Acid Incident (TS07-00). As part of the response to the TSA team finding, a tank inspection and testing program (Comprehensive Tank Management Plan for Hazardous Substance Tank Systems) was initiated. We feel that the response to the TSA team finding will also address this Chromic Acid Incident finding, and we will elevate its priority to reflect the regulatory requirements of the FFCA. Completed elements of the plan include:

- A. Setting up a computerized data base for all tanks;
- B. Development of formal standards and procedures for the inspection and testing of tanks:
  - i. SM-136 "Standard for Tanks Containing Regulated Substances", which includes requirements for secondary containment and leak/level detection;
  - ii. SM-137 "Standard for Inspection of Tanks, Pressure Vessels, and Pressure Relief Devices";
  - iii. SM-138 "Standard for Design of Secondary Containments for Hazardous Liquids" - currently in draft form;
  - iv. SM-139 "Standard for Testing Criteria for Tanks";
  - v. FI 8004 "Facilities Inspection Visual Inspection of Tanks Procedure";
  - vi. QT 2017 "Non-Destructive Testing (NDT) Methods for Testing Wall Thickness";
- C. Preparation of a testing plan and schedule;
- D. Initiation of an inspection program for non-regulated hazardous substance tanks;
- E. Initiation of a tank overflow prevention program for hazardous substance tanks.

The overall status of tank integrity assurance programs at Rocky Flats is as follows:

#### **Hazardous Waste Tanks**

All hazardous waste tanks at the Rocky Flats Plant have secondary containment and therefore do not require assessment and certification. However, as a best management practice, all hazardous waste tanks were assessed and certified in calendar year

1989.

In addition, Rocky Flats is conducting annual hazardous waste tank assessments, including ultrasonic thickness testing, to develop a data base for estimating corrosion rates. This activity is part of the Tank Management Plan to ensure that all tanks are maintained in accordance with best management practices.

For 1990, the annual assessment was expanded to include the 90-day tanks and the six tanker trucks which are classified as containers. Both the 90-day tanks and the tanker trucks are scheduled will be assessed by November 30, 1990, with certification contingent on the results of the assessment.

The previous tank assessments only addressed the tanks up to the first flange. Tank ancillary equipment has not been assessed because it is not required by regulation due to the presence of secondary containment. Assessing ancillary equipment, including piping and pumps, may require shutdown of operating systems, and involves investigation of extensive amounts of piping. It is uncertain that the magnitude of effort required to assess ancillary liquid containment would be rewarded by significant risk reduction. Therefore, there are no plans to assess ancillary equipment at this time.

### **Underground Storage Tanks**

All 23 regulated petroleum USTs are currently undergoing annual tightness testing. Each of these tanks were also tested in either 1988 or 1989. Repairs correcting any tank or piping inadequacies are made as promptly as possible.

Upgrades to five existing USTs are scheduled and include providing continuous tank gauging and spill and overfill protection. Four of these USTs provide fuel for the plant maintenance vehicles and are scheduled to be upgraded by December 22, 1990. The fifth UST will be temporarily taken out of service before upgrading to allow time to develop the required Construction Security Plan.

EG&G's Waste Management organization is initiating a monthly inventory control program for deferred USTs. This program is planned to be implemented by December 22, 1990. Monthly inventory control in combination with annual tank tightness testing satisfies leak detection requirements.

All regulated petroleum USTs are scheduled for replacement with double walled fiberglass tanks by the end of 1996. Meeting this schedule will require that line item funding be provided

beginning in fiscal year 1993.

Four USTs containing #6 fuel oil, a nonregulated substance, are not included in a tank integrity program. Replacement of these tanks is currently included in the Steam Plant Upgrade FCAP Project, which is scheduled for funding in 1991.

### Nonregulated Tanks

Although not required by regulation, Rocky Flats is initiating a program to apply best management practices to those tanks which may contain hazardous non-waste materials and are not located underground.

During fiscal year 1991 contractor assistance will be obtained to field verify the Master Tank Data Base. A program has been begun for visual inspection of tanks by certified weld inspectors and to determine tank wall thickness through nondestructive testing. The verification of the tank data base is scheduled for completion in December, 1991, which will include the first full cycle of visual inspections, based on the existing tank data base. Ultrasonic testing of all tanks is scheduled for completion in 1994.

It is believed that many of the non-regulated tanks do not meet current standards which would be applicable to regulated tanks containing substances which pose a similar degree of risk in the event of a spill. It is expected that these deficiencies will be identified through the findings of the Tank Management Program.

In early 1989 a Tank Overfill Prevention Team (TOPT) was organized to establish physical and administrative spill control measures. The team developed a questionnaire which was sent to the organizations controlling known hazardous substance tanks to determine what spill and overfill prevention features were in place.

The results were summarized in The Executive Report of the Tank Overfill Prevention Team, issued February 6, 1990. A cost estimate performed by the Engineering department on the findings in the report indicates that \$7.5 Million in supplemental funding for Spill Prevention Upgrades will be required to address the deficiencies identified. It is important to note that this estimate was prepared on the basis of response to questionnaires sent to organizations controlling known hazardous substance tanks. It is likely that the planned plantwide visual and ultrasonic field inspections will identify additional deficiencies.

The cost estimate of \$7.5 Million was included in the plant's supplemental budget request of August, 1989. Upon approval of the funding, the Spill and Overfill Prevention Upgrades will be incorporated into the tank management plan. In the interim,

increased administrative controls have been implemented to provide a high level of protection to workers and the environment.

**"18. A need exists to evaluate state-of-the-art, real-time monitoring of the influent and effluent to the Sewage Treatment Plant for hazardous solutions."**

**Status:** In August, 1989 a task team evaluated available instrumentation which could provide some warning of possible contaminants which could either cause an upset condition to the Sewage Treatment Plant (STP) or a threat to the environment downstream if released. The team found that some improvements in STP monitoring capability were available and should be installed. The STP Influent Instrumentation, STP Autochlorination-Dechlorination, and STP Effluent Instrumentation projects were the result of that evaluation and are part of the scheduled actions included in the Compliance Plan submitted to EPA pursuant to this Federal Facilities Compliance Agreement, which was submitted to EPA in July, 1990. Budget for these three projects is \$650,000; schedules for their completion are found in the aforementioned Compliance Plan.

In addition, the Plant is continuing to evaluate new monitoring technology as it is developed, and will pursue funding for additional instrumentation and monitoring needs as appropriate instrumentation becomes available. Current evaluation by the EG&G Environmental Restoration (ER) organization indicates that the use of a real-time automated toxicity testing employing Photobacterium Phosphoreum bacteria might be particularly useful: research following this approach is currently a joint effort between the Microbics Corporation and the French Ministry of the Environment. The Plant is following the results of this research and has been informed that a commercial unit may be available in as soon as two years. Should the device become available and perform as currently expected, the Plant will procure and install them to monitor effluent toxicity in real time. For the interim, beyond conducting the Whole Effluent Toxicity (WET) testing required at the STP by this FFCA, the ER organization is purchasing a Microtox unit employing Photobacterium Phosphoreum to evaluate the suitability of this technology for possible additional routine or emergency effluent monitoring in the future. Also, the Plant has determined that the use of a respirometer to monitor potential toxicity in the STP influent stream may be useful in preventing treatment plant upsets: a respirometer unit and data acquisition system has been purchased as part of the STP Instrumentation project and the ER department is initiating a research effort to characterize the baseline response of the unit.

**"19. A need exists to evaluate options to provide diversion capability for the Sewage Treatment outfall and an action plan to**

implement a diversion action."

**Status:** The plant conducted a STP Influent/Effluent Treatment/Diversion Evaluation in 1989 in response to this finding. The evaluation considered treatment and/or diversion alternatives for handling potentially contaminated influent and effluent streams.

As a result of the evaluation, the influent and effluent storage projects were included as part of the \$8.7 million Sewage Treatment Plant Facility Upgrade package. This is a planned action included in the Compliance Plan for this Federal Facilities Compliance Agreement and submitted to EPA in July of 1990.

"20. A need exists to assure that adequate provisions are made to obtain a representative sample from the waste tanks prior to shipment to Building 374."

**Status:** Piping modifications were made to the waste tanks in room 9A of Building 444 to allow liquids in the tanks to be recirculated to enhance mixing prior to sampling. The Waste Operations procedure for Building 444, Procedure WO-3210, was rewritten to ensure that adequate recirculation would take place prior to sample collection.

A review was conducted of all Liquid Waste Operations operating procedures to ensure pertinent and updated information is incorporated into all procedures used by Liquid Waste Operations personnel. Of the 42 operating procedures identified for Building 374 Operations, 13 directly support the sampling and transfer of plant waste tank contents to Building 374. Of these 13 procedures, 7 have been revised and reissued. The remaining 6 are in draft form and scheduled to be reissued in early 1991.

In addition, steps have been taken to establish traceability of Building 374 operator qualifications, including the personnel responsible for sample collection. In August 1990 EG&G's Waste Operations organization put into place a Training Document File and Job Assignment Log to assure that new procedures are reviewed with operators and that operators who do not perform in a job area for three months are retrained on the procedures specific to that job area.

"21. A need exists to relocate supplies and equipment not directly associated with Waste Operations out of Room 9A."

**Status:** This finding resulted from the storage of painting supplies in Room 9A at the time of the Chromic Acid Incident. Those supplies were removed in March of 1989. Recurrence has been prevented by checking the room as part of a daily Monitor Watch inspection.

"22. A need exists to alleviate the confusion regarding spills and appropriate RCRA actions, and internal plant notification for spills of hazardous materials both inside and outside of buildings. Notification and communication is paramount."

Status: A resumption work package has been developed to plan the actions needed to correct this finding, as well as Judgement of Need Number 23. The specific tasks are described below in the response to Judgement of Need Number 23.

"23. A need exists for the plant site to establish a coordinated external notification plan that will ensure required notification to be made within the proper time limits."

Status: A large amount of effort to address this concern and the related concern embodied in Judgement of Need Number 22 took place prior to the change in operating contractor from Rockwell to EG&G. As part of the pre-resumption review, EG&G management determined that the previous efforts, while an improvement, were inadequate.

A resumption work package has been developed by EG&G's Emergency Preparedness (EP) department which addresses both this finding and Judgement of Need Number 22. Specific tasks currently planned include:

A. Develop Occurrence Categorization Procedures: this will result in a draft document that establishes the process and responsibilities for making occurrence categorizations at the RFP per DOE Order 5000.3A;

B. Develop Occurrence Notification Procedures: this will result in a draft document that establishes the process and responsibilities for reporting all occurrences at the RFP per DOE Order 5000.3A;

C. Develop and Approve Occurrence Categorization Training: a training program for categorizing occurrences will be developed;

D. Develop and Approve Occurrence Notification Training: a training program for making notifications per DOE Order 5000.3A will be developed;

E. Conduct Occurrence Categorization Training: the EP organization will conduct documented categorization training for specific disciplines and key management;

F. Conduct Occurrence Notification Training: the EP organization will conduct documented notification training for disciplines and key management;

G. Establish a 24-hour Occurrence Notification Center;

H. Approval of Occurrence Categorization Procedures: the General Manager of the Plant and the Plant's Quality Assurance (QA) department will review and approve the final categorization procedures;

I. Approval of Occurrence Notification Procedures: the Manager of the EP, and the QA department, will review and approve the notification procedures;

J. Modify Hazmat/Substance/Waste Release Response Procedures to Include CERCLA and SARA Title III Reporting requirements and all Plans Required by Regulation;

K. Approval of Response Procedures: the Plant's General Manager, and the QA department, will review and approve the response procedures;

L. Adapt General Employee Core Training to Include Occurrence (spill) Reporting Requirements: the Plant's RCRA Permitting and Compliance department will develop input to the basic employee training course:

M. Conduct General Employee Training: the Performance Based Training Organization will complete documented training for general employees.

While the schedule has not yet been finalized, current target date for completion is May of 1991.

**"24. A need exists to update the AL Order 5484.1 with respect to notification procedures and the organizations involved."**

**Status:** Since the time of this finding, the Department of Energy has placed Rocky Flats directly under Headquarters' direction rather than under the direction of the Albuquerque (AL) Area Office, thus rendering DOE-AL's orders inapplicable to operations at Rocky Flats.

DOE Order 5000.3A provides a formal protocol for occurrence notification. The response to Judgment of Need Number 23 addresses the integration of the requirements of the DOE Order into the Plant's procedures and administrative structure, and the training of personnel in the requirements applicable to their

position.

**"25. A need exists to review and establish a protocol for the receiving and dissemination of notification information to appropriate AL organizations."**

**Status:** Since the time of this finding, the Department of Energy has placed Rocky Flats directly under Headquarters, thus rendering DOE-AL's procedures moot with respect to operations at Rocky Flats.

**"26. A need exists for response training to spill conditions in Room 9A including the use of appropriate protective gear."**

**Status:** Documented training for response to spill conditions in Room 9A of Building 444 was provided to all Building 444 employees who might be assigned to work in the vicinity of Room 9A. Training for appropriate protective gear for all jobs, including those involving spill cleanup, is provided in job specific training, pre-evolution, or work permit at time of job.

The Building Emergency Support Team (BEST) assists in building emergencies. In the event of a spill of hazardous materials their function would be to prevent other employees from entering the affected area, pending the arrival of the Plant Fire Department, which has a certified hazardous materials response unit.

**"27. A need exists to coordinate waste tank shipments between Waste Operations and Plating Laboratory management."**

**Status:** Current requirements enacted subsequent to the Chromic Acid Incident provide a coordination mechanism which addresses this concern. The effect of the requirements is as follows.

Qualified personnel from Building 374 Liquid Waste Treatment Operations assigned to waste tank duties respond upon notification by the user (waste generator, ie: Plating Laboratory in this instance) to perform sampling/transfer activities as necessary.

To coordinate access to the waste tanks, the Waste Operations personnel communicate with the building management the day prior to the sampling and transfer to get that activity listed on the following day's Plan-of-the-Day (POD) for that particular building. This communication process is known as "pre-evolution". The pre-evolution and POD process ensures that the building management are aware of all planned activities in the building.

**"28. A need exists to improve worker and management attitudes towards maintenance of systems in the Plating Laboratory, written operating procedures, and safety systems."**

**Status:** Management of maintenance activities has been improved by daily meetings for planning, prioritizing, and developing the Plan of the Day. A new Operational Safety Analysis was written to cover operating procedures and safety systems within the lab.

Other Areas and Concerns

"1. A study needs to be performed to evaluate the long term problem of discharge of liquid effluents from the Rocky Flats Plant both because of the spray irrigation required by the current NPDES permit on unstable soils and the holdup/diversion considerations."

**Status:** A zero discharge study is required by the Agreement-in-Principle between the DOE and the State of Colorado. The purpose of the engineering study is to assess the feasibility of implementing some form of zero discharge practices. This study is underway by an EG&G subcontractor, at a cost of approximately \$2.0 Million. It is being funded as an expense item under Authorization 986804, with \$.9 M coming from FY '90 and \$1.1 M coming from FY '91 budgets.

Schedule is as follows:

Task	Start	End
Statement of Work	11/89	12/89
Expert Scope Evaluation	12/89	3/90
Design Storm Recurrence Intervals and Present STP and Landfill Evaluations	6/90	7/90
Water Storage Capabilities, Wastewater, Recycle, and Tributary Source Water Yield Quality to Standley/Great Western Reservoirs	6/90	9/90
Process Waste Minimization	8/90	10/90
Domestic/Process Recycle, Reverse Osmosis/Mechanical Evaporation, Ground Water Recharge, and Water Resource Management	5/90	2/91
Rainfall/Runoff Relationships, Ground Water Cutoff/Diversion, and Zero-Discharge Alternatives	4/90	3/91
Drain Verification, Waste Generation Treatment, Non-Tributary Ground Water,		

Surface Water Evaporation, and Downstream Erosion Potential	6/90	4/91
Sanitary/Storm Sewer Infiltration, Non-Point Source, Water Rights/Augmentation Plan, and Zero-Discharge Consolidation	4/90	6/91
EG&G Verification	6/91	8/91
DOE Verification	8/91	10/91

In addition, the plant is interacting with the local communities, EPA, and the Colorado Department of Health in an effort to obtain broad input in the development of the long term Surface Water Management Plan. Elements of the Surface Water Management Plan will address issues related to discharges from Rocky Flats Plant, including various alternatives for isolation of the Plant's runoff from nearby municipal water supplies.

We propose that the interim milestones be considered as guidance only, and that the verified completion of the Zero Discharge study, scheduled for October 1991, be considered the reporting milestone in accordance with Section V (C.) of the FFCA.

**"2. A need exists to review the margin of safety in the B-5 dam structure in view of continued spraying in the South spray field."**

Status: Spraying in the South spray field has been permanently discontinued.

An evaluation of dam stability will be performed by the Army Corps of Engineers (ACOE) under the Detention Pond Dam Upgrades project, under contract directly to DOE. The scope of this finding has been broadened to include evaluation of the dams at the three terminal ponds, A-4, B-5, and C-2.

Water sources and discharge receivers will be evaluated to assess the potential for long term detention requirements as well as dam failure impacts. This action will be concurrent with a review of design calculations and field conditions to identify the level of integrity associated with each dam. If the designed safety factor or in-situ conditions of the dam warrants, a detailed analysis will be conducted and any required upgrades identified.

Schedule is as follows:

Task	Start	End
Work Plan, Health & Safety Plan	4/90	10/90
Formulate Drilling/Sampling Plan	4/90	4/90

Drilling/Sampling	10/90	10/90
Formulate Testing Plan	11/90	11/90
Soil Testing	11/90	5/91
Stability analysis	1/91	8/91
Prepare Draft Report	8/91	10/91
Review by ACOE/DOE	10/91	11/91
Revisions/Answer Comments	11/91	11/91
Reproduction of Final Report	12/91	12/91
Recommendations	12/91	2/92

We propose that the completion of the report, including recommendations for any necessary dam upgrades (scheduled for February 1992) be considered the FFCA Section V (C.) reporting milestone for this finding.

"3. A need exists to review foundation footing drains in other onsite facilities where hazardous materials could be introduced into the Sanitary Sewer System."

Status: The scope of this finding was broadened to include other possible sources of hazardous or otherwise inappropriate influents to the sanitary sewer system. Planned activities relevant to this finding include:

A. Internal drains evaluation per the following criteria:

- i) Verification that all floor drains in risk areas are labelled as process waste drains;
- ii) Verification that all floor drains labelled as process waste drains do not feed into the sanitary waste system;
- iii) Verification that all sink drains in risk areas are labelled as process waste drains;
- iv) Verification that any sanitary sink drains located in areas containing radioactive or chemically contaminated materials do not meet the definition of being in a risk area;
- v) verification that all sink drains labelled as process waste drains do not feed into the sanitary waste system.

- B. Identification of possible contaminant sources and risk areas;
- C. Building and footing drain evaluations.

As part of the pre-resumption effort, the internal drains in the six plutonium handling buildings (771, 559, 707, 779, 776/777, 371) were evaluated. The assessment team issued a report, "Final Report - Environmental Permit Verification for Resumption Revision 1" (resumption document #POR6025R025), in August, 1990.

The report identified 87 drains and restroom areas that required pre-resumption action, and numerous post-resumption recommendations, including the overall recommendation that all sanitary drains be removed from Radiation Control Areas and areas containing chemicals. The pre-resumption activities are included as tasks for closeout in the overall plant resumption plan; the remaining actions have not yet been scheduled.

In addition, an effort is underway to continue beyond the resumption effort in conducting studies of the internal building drains for all other buildings which handle hazardous chemicals or radioactive materials, as well as identification of risk areas and evaluation of the footing drains for all facilities which handle chemicals and radionuclides.

Of the 193 facilities on plant site, a preliminary field survey has been completed on 41 facilities and is in progress on 66 others. A preliminary site and drawing evaluation has been completed on all the major buildings.

A Statement of Work, reference guidelines, and preliminary assessment criteria for the plantwide Drain Identification Study have been prepared, and a contractor has been selected: Fluor Daniels, Inc. is scheduled to begin work in November, 1990. The initial tasks of the subcontractor's effort will be to develop formal assessment criteria and work procedures for the project, to be followed by a work schedule.

While the actual work schedule has not yet been completed, elements are likely to include:

- A. Writing and review of formal evaluation procedures and assessment criteria;
- B. Assessment team training and building indoctrinations;
- C. Field evaluations of 193 buildings;
- D. Location, review, and generation of as-built drawings;
- E. Integration of findings into a major corrective action plan;

F. Miscellaneous schedule elements such as review and approval steps, QA surveillance, planning meetings, and currently unforeseen activities.

The rough estimate for the assessment activity itself is between \$2 Million and \$3 Million, with estimated duration of 58 months. Significant additional expenditures are likely to be required to address the deficiencies expected to be identified in the evaluation phase, but cannot presently be estimated.

It is the intent of EG&G to evaluate higher hazard facilities first, and begin planning and budget identification of required corrective actions as deficiencies are discovered.

**"4. A need exists in Building 444 to improve the generally poor attitude and relationship between management and the hourly crafts employees regarding information flow and safety conditions, both real and perceived. An indifference to job performance exists."**

Efforts to address the root causes of this concern have since been taken both in Building 444 and plantwide, although not necessarily solely as a result of this investigative board finding.

In Building 444 the building management has modified the "toolbox" and safety meetings to enhance face-to-face communication between management and hourly personnel. The Building Manager has also implemented a weekly meeting with all supervisors in the building to facilitate communication the various departments and organizations.

Plantwide actions which relate to this concern include an employee survey which was conducted by an independent subcontractor, which provided a unique channel of information flow to management. Other actions include establishing In-Plant telephone hotlines to allow employees calling in to get posted written answers from management on any subject, confirm or put to rest rumors, or report safety concerns.