RADWASTE THREE PHASE PLAN:

BACKFIT MODIFICATIONS AND EVALUATIONS AT SAN ONOFRE UNITS 2&3

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ABSTRACT

The Radwaste Three Phase Plan was developed to provide a comprehensive, integrated program to perform recommended modifications to the radwaste systems at San Onofre Nuclear Generating Station, Units 2 and 3. The Radwaste Task Force was also created to ensure operation of radwaste systems as described in the FSAR and consistent with the established operating philosophy. The modifications are required due to the impact of changes in burial site disposal requirements and additional regulatory requirements, the need to correct design and operation inadequacies discovered during start-up and initial plant operation, and to increase the operational flexibility of the radwaste systems. The changes recommended in Phase I are well into various stages of engineering and construction; Phase II evaluations are now underway; and the final scope of Phase III tasks will be identified as the Phase II evaluations are completed.

BACKGROUND AND HISTORICAL OVERVIEW

San Onofre Nuclear Generating Station is comprised of three generating units; Unit 1, a 450 MWe Westinghouse NSSS in commercial operation since 1967; Unit 2, an 1100 MWe Combustion Engineering NSSS in operation since 1983; and Unit 3, an 1100 MWe Combustion Engineering NSSS now approaching completion of it's power ascension testing.

San Onofre Units 2 and 3 were designed and constructed as a single project and for the most part, share a common Radioactive Waste Management System. This system is composed of the Coolant Radwaste System (CRS), Coolant and Boric Acid Recycle System (CBARS), Miscellaneous Liquid Waste System (MLWS), Gaseous Radwaste System (GRS), and Solid Waste Management System (SWMS). The systems most germane to the radwaste modifications at San Onofre and thus this paper, are the Miscellaneous Liquid Waste System, the Solid Waste Management System, and to a lesser degree, the Gaseous Radwaste System.

Waste Management Philosophy and Design Bases

The waste management philosophy and design bases at San Onofre Units 2 and 3 are probably consistent with that at most other nuclear generating units. Simply stated, that philosophy is to minimize the quantity of waste produced (both liquid and solid) and the quantity of wastes that must be shipped offsite and/or discharged while assuring safe, efficient and consistent radwaste system operation within regulatory restraints and ALARA guidelines. To that end, the design bases for the liquid, gaseous and solid waste management systems are as follows:

1. To provide for the collection of all wastes generated during plant operation which potentially contain radionuclides.
2. To provide sufficient hold-up and processing capability such that liquid waste may be discharged at concentrations well below the regulatory limits of 10 CFR 20 and consistent with the ALARA guidelines of 10 CFR 50. (MLWS, GRS)
3. To provide the capability of producing recycle-quality water as a source of condensate for flushing and resin-sluicing purposes (MLWS).
4. To provide for purification of RCS wastes to enable reclaimed water and boric acid to be reused in the RCS (CBARS).

INCEPTION OF THE RADWASTE THREE PHASE PLAN

Initial Plan/Concerns

The original design and construction of San Onofre Units 2&3 (SO23) included an in-plant Urea Formaldehyde (UF) waste solidification system. In 1979, for numerous reasons not of direct significance to this discussion, the SO23 Project decided to abandon, in place, the installed UF System. Part of the justification for that decision, aside from the technical concerns related to UF solidification, was an indication from the NRC that an installed in-plant system capable of meeting the proposed solidification standards was not a licensing requirement providing that acceptable, alternate means for solidification was available. In subsequent discussions with the NRC, it was determined that acceptable, alternate means of solidification would include a valid contract with a mobile solidification system vendor who has an NRC approved Process Control Program (PCP). Regardless, with the decision to abandon the UF System in-place, SCE knowingly negated use of not only the installed solidification process, but also the liner and DAW handling systems, the high level (solidified product) storage area, and to a lesser degree, the spent resin transfer system.

To accommodate waste solidification at SO23 and to comply with NRC regulations, SCE entered into a contract with a vendor of mobile cement solidification services. At that time, SCE intended to utilize those services only until a new solidification system could be designed and backfit into the Radwaste Building.

Regardless of those intentions, because the mobile system was now the primary means for solidification, because the solidified waste storage and handling capability was designed around use of the UF system, and because SCE had concerns regarding site-wide (including Unit 1) waste storage and handling, SCE procured the services of a consultant to review and document the radwaste processing, handling and storage capabilities at San Onofre. The study was initiated in late 1980 and was to include:

1. an evaluation of the existing capabilities and shortcomings for accommodating liquid and solid wastes,
2. an evaluation of existing solidification systems and binding mediums insofar as backfitting them into the existing San Onofre Units 2 and 3 Radwaste Building, and
3. an evaluation of storage availability for solidified wastes and DAW.

Independent of the study, SCE Nuclear Engineering and Operations recognized other potential problems associated with the subject systems as well. These, as well as NRC "concerns" (particularly regarding on-site storage capability for up to 2 years' generation of radwaste), were evaluated and documented.

As the study drew to a close and the final drafts were reviewed, it was clear that while the study was a good start, further work was needed. What was lacking was a comprehensive, organized and integrated program (and associated schedule) to document all the concerns identified to date and to recommend specific solutions to those problems. As a result, the Radwaste Three Phase Plan was developed in April, 1982. Phase I was to have included six specific tasks to be implemented as soon as possible to increase the flexibility and functional capabilities of the existing facilities. Phase II included modifications to facilitate waste handling and storage until Phase III was completed. Phase III was to have provided for both the eventual backfit of an in-plant solidification system and a sufficient amount of on-site solidified resin and DAW storage.

Radwaste Task Force

About the time the initial Three Phase Plan was developed, San Onofre Unit 2 began its power ascension testing which meant the Radwaste Systems would now be used to process waste. To ensure all the involved organizations understood the system capabilities and the operating philosophy as described in the FSAR, to identify and act on any design or operating problems, and to ensure an effective, open channel of communication existed between all organizations involved in either the design or operation of radwaste systems, the SCE Radwaste Task Force (RWTF) was created. The RWTF includes representatives of Corporate Nuclear Engineering, Corporate Mechanical Engineering, and Station Engineering, Radwaste, Health Physics, Operations, Effluent Engineering, and Chemistry groups. The RWTF is mentioned herein because, since its inception, it has become the single, most-effective influence on radwaste philosophy, procedures, design, operation and the Radwaste Three Phase Plan. All recommended radwaste system design changes are either originated or approved by the RWTF.

Revision to the Three Phase Plan

Both the ascension program for, and commercial operation of, San Onofre Unit 2, have provided SCE with a wealth of information regarding the capabilities and more importantly, the inadequacies (both design and operation) of the radwaste systems. Those inadequacies provided the bases for revision of the Three Phase Plan (to its current state) in the beginning of 1983. It should be noted that the identified inadequacies only affected ease of operation and system flexibility. The systems' capability to comply with the established design bases or existing regulatory requirements was not in question. The intent of Phase I remains the same (make the the existing systems as functional and flexible as possible as soon as possible); however, as of September, 1983, Phase I now includes a total of 17 tasks (some tasks include more than one and as many as five specific modifications). Phase II has been expanded to include 19 evaluations. Phase III is now relegated to implementation of those modifications deemed necessary by the Phase II evaluations.

The modifications and evaluations identified in the Three Phase Plan are based on the following:

1. The need to support mobile solidification system operation,
2. Correction of design inadequacies identified during initial operation of the radwaste systems,
3. Correction of operational and procedural inadequacies identified during initial plant operation,
4. The need to simplify and increase the flexibility of radwaste system operations,
5. The need to provide for additional radwaste handling and storage requirements,
6. Compliance with new/revised NRC requirements (e.g., 10 CFR 61), and
7. The need to assure safe, efficient and consistent radwaste operations within regulatory restraints and ALARA guidelines.

The Three Phase Plan was developed to provide an organized plan to implement necessary changes, to perform the necessary evaluations to justify and document those changes, and to ensure future radwaste requirements are met while incurring no operational impact and minimizing Project cost and schedule impacts. Additionally, the Plan is intended to be flexible enough for change when conditions warrant.

THREE PHASE PLAN TASK SUMMARY

The Radwaste Three Phase Plan identifies numerous evaluations, problems and solutions ranging from those presented below to other minor concerns (e.g., providing heat tracing on certain waste process lines, adding filter bypass lines, or addition of a check valve in certain lines to preclude backflow of resins into those lines). Those concerns considered by the author to be either minor or of interest to a select few are not presented here. Those believed to be of broader interest follow.

Phase I Tasks

1. Procure a Solidified Waste Handling System. The problems initiating this task are as follows:

a. Spent/Solidified resin handling to support liner storage and disposal at SO23 was predicated on the installed in-plant UF system and use of 50 cubic foot liners. Upon abandonment of the UF system, existing methods of liner handling and storage were rendered useless.

b. Due to NRC concerns, plans existed (and were completed through final engineering) to construct a solidified resin storage facility for Unit 1 solidified wastes. A portion of this task required providing a handling system for solidified liners to complement the storage facility. All three units at SO123 were to utilize the same liners for waste solidification and/or disposal so any storage facilities constructed can be utilized by all three units. Therefore, a handling system capable of servicing all units was desirable.

c. The SO23 radwaste building truck bay was not designed for performing solidification operations as a routine activity even though the original design provided the capability for pumping spent resins and concentrated wastes to the truck bay for disposal. As such, the level area of the truck bay will not accommodate the low-boy trailer commonly used for spent resin shipping and the on-truck solidification process (i.e., the trailer will not sit level causing equipment handling problems and inefficient use of the liner volume).

d. Current available methods for mobile solidification at SO123 do not provide for shielding of personnel performing solidification/cask handling tasks.

e. No method exists for transporting liners of solidified waste around the site when necessary for operational/storage flexibility and preparation for shipment off-site.

f. Implementation of 10 CFR 61 requirements could mandate the immediate availability of shielded storage locations for liners of solidified resins (up to 200 cubic foot capacity) until off-site radionuclide analysis for the shipping manifest is completed. Shielded storage is also required while preparations for off-site shipment are completed.

g. The San Onofre site is extremely compact due to its seaside location; additional space for storage and handling within the power block is at a premium. As such, a handling system capable of moving solidified liners from location to location on the site was desirable.

The solution entails procurement of a handling system which accommodates all of the above concerns and also adds a degree of waste handling flexibility not currently available or available with stationary gantry cranes at on-site storage facilities.The proposed system is composed of the following equipment:

a. A portable, self-powered, straddle crane capable of lifting a 200 cubic foot liner of solidified waste and the associated shield bell (total capacity of approximately 40 tons) and capable of accommodating tight corners and turning angles.

b. A shortened, low-boy trailer capable of the same loads as described above, meeting DOT regulations, and accommodating the small level area of the radwaste truck bay. Also required is a suitable tractor.

c. A liner shield cask capable of providing adequate personnel shielding for liners with a surface dose of 50 R/hr. This cask must also provide a built-in hoist mechanism for a liner containing solidified waste.

d. Shield cask/shipping cask interface plates to provide adequate shielding and interface alignment between the shield cask, shipping casks and storage facilities for various size solidification liners.

e. Individual storage casks for interim on-site storage and shielding of solidified liners.

2. Modifications to the process waste piping in the radwaste building truck bay and to the existing spent resin piping. The modifications were dictated by the following:

a. Unnecessarily long spent resin piping runs due to abandonment of the UF system leading to concerns regarding resin transfer capability and personnel shielding (ALARA).

b. The present truck bay piping configuration requires numerous manual hose changes to accommodate the various waste streams thus increasing the probability of waste spills and unnecessary operator exposure.

c. The original plant configuration provides no means of bypassing the spent resin tank for direct solidification of resins from the various ion exchangers.

d. Due to changes in burial site criteria, the existing crud tank filters installed in the plant are not suitable for burial as planned. Therefore, the capability for solidification of crud directly from the crud tank is required.

e. A means for use of portable ion exchange units was lacking.

The solution involved designing a valved manifold within the limited space of the truck bay to eliminate the above problems, simplify the waste solidification processes, simplify resin transfer operations, and supplement use of the mobile radwaste system. This modification also provides additional justification for not backfitting a permanent in-plant solidification system. The manifold is now in place and works as designed.

3. Modifications to portions of the Nuclear Condensate System. The concerns predicating this modification are as follows:

a. Condensate quality water to supply the Nuclear Condensate Header is not easily achievable. The RWTF and an independent station position recommended against recycle of miscellaneous waste for various reasons. An IE Information Notice also indicates that recycle is not desirable and that extensive chemical (including organic) analysis would be necessary.

b. No capability existed for reprocessing of the final hold-up tanks prior to discharge (25,000 gallon capacity each) without pumping back to the first tank in the processing system (6,000 gallon capacity). That tank, the Miscellaneous Waste Tank (MWT), is already undersized and would contain waste having contamination levels that are higher than those to be reprocessed.

c. No capability existed for reprocessing one hold-up tank while discharging the second.

d. No capability existed for use of the Miscellaneous Waste Evaporator for CBARS while waste is being processed through the MLWS ion exchangers. This situation limited the operational capability of the MLWS.

The above problems were eliminated by implementation of the following design changes:

a. The Condensate Monitor Tanks (CMT) were the source of recycled liquid waste to supply the nuclear condensate header. With the decision to minimize use of recycled liquid waste as condensate, the CMT's were converted for use as discharge hold-up/batch tanks.

b. Piping was added between various lines to provide the direct connection of the Nuclear Service Water System (NSWS) as a source of condensate to the nuclear condensate header.

c. A bypass around specific valves was added to allow for pressurization of the condensate header by the Primary Makeup Water Pumps as an alternate source of nuclear condensate.

d. To prevent contamination of the condensate header and to ensure adequate water quality in the condensate header, a spool piece and blind flanges were added to isolate the Condensate Monitor Tank Pumps from the condensate distribution header. In this way, the capability to recycle is not eliminated. However,prior to reinstalling the spool piece, strict chemistry, sampling and operational procedures must be implemented to accommodate recycling.

e. The addition of a piping and valve manifold to allow for the direct cleanup of the discharge hold-up tanks by the MLWS ion exchangers without first pumping back to the MWT.

f. A cross connection between the inlet and outlet of the Miscellaneous Waste Evaporator was added that allows for its use in the CBARS concurrent with waste processing by the MLWS.

4. Relocate the Radwaste Discharge Line. The concerns dictating this modification are:

a. Effluent from the radwaste discharge line could splash out of the seawater discharge tunnel vent and potentially contaminate an unrestricted area.

b. The discharge line ran through an unrestricted radiation zone ($<.25$ mr/hr.).

c. Installation of a blowdown bypass (BDBP) line created a potential for radwaste effluent to discharge onto the hot BDBP line and flash to steam thus causing a potential airborne contamination problem.

As a solution, the line was rerouted to discharge with the Component Cooling Water seawater discharge line. Numerous flow and pressure interlocks were provided to ensure effluent could not be discharged without adequate dilution and analysis. Further, the seawater discharge sampling points were relocated to ensure radwaste effluent could not interfere with analysis results.

5. Relocate the DAW Compactor. The NRC expressed concerns with the installed location of the DAW compactor regarding the potential for airborne contamination and the resulting possibility of an unmonitored release. Additionally, DAW handling and storage schemes under development indicated relocation was warranted. As such, the compactor was relocated within the Radwaste Building with direct connection to the building ventilation system. Fire protection provisions are being reviewed to ensure the adequacy of such protection and ensure compliance with the Fire Hazards Analysis.

6. Sample System Provisions for the Solidification Process. The implementation of 10 CFR 61 at SO23 requires the capability to provide adequate sampling and analysis for radionuclide identification and quantification. The original plant design did not provide such capability. SCE therefore designed an in-line sample system to accommodate that analyses. As a note, SCE is also informing the NRC of its intent to use the AIF calculational technique as another method of radionuclide identification and quantification.

7. Radwaste Sump Level Instrumentation. Currently, the only receptacle for discharge of the 23,000-gallon radwaste sump is the 6,000-gallon Miscellaneous Waste Tank (MWT). As such, both sump and MWT levels must be carefully monitored. Currently there exists no instrumentation to determine the sump level while pumping to the MWT, to determine that the sump is filling, or to determine the remaining sump surge capacity, without visual inspection. Level instrumentation in the sump and readout in Radwaste Control Room will be provided to simplify transfer operations and preclude an overfilling of the sump.

8. Radwaste Area Truck Bay Berm and Epoxy Coating. As discussed previously in this paper, solidification of wastes is provided by a mobile system which is located in the truck bay. To ensure the truck bay is suitable for such operations, a berm was added to contain potential spills and the floor and walls (up to two feet from the floor) were epoxy coated to ease any required decontamination efforts.

9. Radiation Level Monitoring for Ion Exchangers (IX) and Demineralizers. In order to facilitate transfer of spent resins and minimize the potential for excessive operator exposure, small plugs are being core drilled into IX/demineralizer floor hatches to provide access for portable detectors. Technicians can then survey the IX's without unnecessary whole body exposure to determine the approximate dose rates of the spent resins. This information will then aid the operator in determining the best method for transfer and storage/disposal of spent resins.

10. Divert Component Cooling Water (CCW) and Caustic Soda Room Drains. Drains from the CCW Heat Exchanger rooms and the Caustic Soda Storage Tank rooms are currently routed to the Radwaste Sump. From the sump, liquids are processed through the MLWS ion exchangers. High concentrations of chlorides or caustics will deplete the resin beds and force treatment of wastes by other less efficient means. As such, drains from these rooms are to be rerouted to other suitable, monitored sumps.

11. Startup Problem Report (SPR) Resolution. In response to a request from the SO23 Project, the RWTF assumed the lead responsibility for resolution of all SPR's on radwaste systems (excluding those pertaining to instrumentation and Radwaste Building HVAC). Any necessary modifications resulting from SPR resolution were implemented through the Three Phase Plan. Sample SPR's reviewed are as follows:

a. Miscellaneous Waste Evaporator Conductivity Cell. A problem regarding operation of the evaporators in the automatic mode was identified. Specifically, the conductivity cell has a control range of 0 to 10μ Mho. Condensate is not discharged to the hold-up tanks (but rather recycled within the evaporator) until water conductivity is less than 10 μMho. However, water of this quality is no longer required since condensate is not recycled. A conductivity cell of 0-200 μMho is being installed.

b. Waste Gas Surge Tank Relief Valve. Lifting of a sample return line relief valve due to waste gas surge tank pressure increases was identified as a problem because the pressure downstream of the WGS sample pump increases two pounds for every pound increase in the surge tank. The system was redesigned with appropriate pressure control valves.

c. Crud Tank Filter Handling. Due to changes in burial site disposal criteria, the original filter housing and disposal methods were rendered useless. The housings were modified to accommodate a filter that can be disposed. However, the method of filter handling (for all filters) is still not adequate. The RWTF investigated the problem and is procuring an appropriate filter handling system.

d. Radwaste Discharge Monitor. Adequate flushing provisions for the radwaste discharge monitor were apparently not provided. The monitor becomes laden with crud and cannot be adequately flushed. Currently, the monitor has to be removed, disassembled, and cleaned every two weeks. Removing the monitor from service to perform this maintenance imposes excessive manpower requirements to supplement sampling, analysis, etc. A high volume flush is being provided to reduce such maintenance activities to once every 90 days.

12. Miscellaneous Tasks. The following concerns represent a sampling of the problems addressed by the Radwaste Task Force and accommodated in Phase I:

a. Spent resin tank level indication. The Spent resin tanks currently have indication which utilize ultrasonics to determine tank level. This type of instrumentation can only detect the level of the resins and/or water. Resin/water interface level detection is not possible with ultrasonic level indication. Other commercially available types of level indication must be evaluated for use at SONGS. Equipment installation is the limiting condition for performing this change.

b. Pressure indication for demineralizers. Currently the demineralizers do not have direct indication of vessel pressure. During resin transfer operations, when nitrogen gas pressure and nuclear condensate pressure are used as the motive forces, initiation and termination of resin flow cannot be readily determined. With pressure indication on the vessels, flow initiation (i.e., pressure reduction) and flow termination (i.e., pressure increase) would be directly obtainable. Further, pressure indication on the vessels would greatly reduce the potential for operator error through incorrect valving of the vessel while the vessel is pressurized.

Phase II Tasks - Evaluations

1. Evaluate the Structural Capability of the Low-Level Storage Area to Accommodate Storage Modifications (including addition of a 40-ton crane). Additional solidified waste storage capacity will be required. Modifying the existing low-level storage area to accommodate large capacity liners is one method; however, a determination as to the extent of structural modifications required (if any) is to be performed.

2. Evaluate Construction of the Unit 1 Resin Storage Facility versus Units 2 and 3 Low-Level Storage Area Modification. As a result of NRC concerns, a resin storage facility was to be built at Unit 1. Engineering was completed but because of the status of Unit 1 and the Units 2 and 3 Power Ascension Program, construction was not started. The objective of this task is to determine which method is better suited (under current conditions) to provide solidified waste storage capability for all three Units.

3. Evaluate/Document the Need and Recommendations for Solidified Waste Storage in Addition to Construction of the Facility Recommended in Item 2 Above. SCE may have no burial facility available for waste disposal after January, 1986. California has not actively participated in Regional Disposal Compacts. Options include the second facility from the Item 2 evaluation and/or provision of a new waste storage building.

4. Evaluate High Density Compaction and Incineration as Options for DAW Volume Reduction.

5. Evaluate In-Plant Solidification Versus Continued Use of the Mobile System. The original intent was interim use of the mobile solidification system when the UF system was isolated. In light of extensive Phase I modifications (which support use of mobile solidification) and expected high cost of backfitting an in-plant system, continued use of the mobile solidification may be the most efficient and effective alternative.

6. Evaluate/Document Need for Additional Liquid Waste Holdup Capacity. The existing Miscellaneous Waste Tank (6,000-gallon capacity) is processed more than twice a day. Surge capacity is severely hampered because of the current volume of miscellaneous liquid waste processed.

7. Filter Usage/Efficiency Study. Filter usage in radwaste systems is higher than expected for various reasons. Additionally, backflushable filters as used in the current configuration may not be most efficient method for filtering liquid wastes and crud. Alternative filters having higher porosity and/or larger surface area are being evaluated in the various waste streams.

8. Filter Handling Evaluation. Currently changing of radwaste filters involves much "hands on" work. As the radwaste system is used, personnel exposure will increase. Remote/shielded handling methods will be investigated.

9. Define Chemistry/Effluent Support to meet Radwaste Processing Requirements. Waste processing is heavily dependent on chemistry/effluent sampling and analysis for proper processing and discharge. A comprehensive support and interface program must be established to better define those requirements.

10. DAW Handling and Storage Based on Information from Related Phase II Studies and Current DAW Handling Schemes at San Onofre Units 2 and 3 and Unit 1. An integrated DAW handling and storage methodology should be established since the original plant design was based on use of UF system transfer components. Relocation of the DAW storage area and the addition of DAW segregation equipment requires additional handling considerations. Additional DAW storage facilities may also be required.

11. Evaluate the Efficiency/Usability of Radwaste Control Panel with Regard to Reflecting System Operation. The current control panel is a collection of random displays rather than a true reflection of system operating status (i.e., mimic board). An organized panel reflecting system operation may be warranted especially in light of the new flexibility designed into the system.

12. Radwaste Manpower Recommendations. Safe, efficient, and consistent radwaste processing is highly dependent on personnel familiar with the system. Unit 2 and 3 should implement a dedicated radwaste operating staff.

13. Identify Changes Needed to Accommodate Use of Mobile Demineralizers. Current system waste loads are taxing existing processing capabilities. At some time, mobile demineralization services may be required.

14. Removal/Salvage of UF System Components - Recommendation and Costs. The UF system was abandoned in place. The evaluation will determine the costs and benefit of removing and salvaging piping and components of that system.

15. Investigate Gaseous Radwaste System (GRS) Downgrade. Modifications may be made to the GRS in the future. Some portions of the GRS are defined as safety related. Modifications can be more easily implemented and replacement parts more easily procured if a portion of the system is classified as non-safety related. This evaluation will determine the viability of downgrading the GRS to non-safety related, identify the potential benefits of such a downgrade, and perform any necessary analysis to justify a downgrade.

16. Consider the Impact of Full Flow Condensate Polishing Demineralizers (FFCPD) on Radwaste Systems. The FFCPD's will require resin changeout/regeneration which could increase the radwaste processing requirements and possibly tax the radwaste system capacities. The evaluation will address that impact and provide recommendations to accommodate the increased processing requirements.

17. Evaluate Need for Continued Use of Radwaste Sump Filtration. Due to the abnormal quantity of particulates found in the radwaste system during initial operation, the RWTF implemented a temporary method of radwaste sump recirculation/filtration to alleviate the clogging problems in the downstream filters. To make this a permanent modification, a permanent power source and other installation modifications are required. This evaluation will address the costs and benefits of continued use of these filters.

18. Gaseous Radwaste System (GRS) Evaluation. Problems with the Waste Gas System (GRS) were encountered during start-up testing and initial operation and were documented by various SPR's. The

operation and design of the GRS will be reviewed to ensure the corrective action taken has resolved the earlier problems and the GRS is functioning correctly.

19. Waste Minimization Program. A key factor in radwaste system operation is minimization of the amount of waste requiring processing and disposal. A water management program is being investigated for liquid wastes. Procedural/management programs for DAW minimization and segregation must also be developed and implemented.

Phase III Tasks

All Phase III activities (with the exception of Item No. 1) are potential, to be based on the results of Phase II evaluations.

1. Provision of interim waste storage facilities.

2. Addition of DAW volume reduction components (High Density Compaction or Incineration).

3. Potential filter housing/handling modifications.

4. Additional waste holdup capacity.

5. Miscellaneous construction tasks from other Phase II evaluations and resulting recommendations from the RWTF.

CONCLUSION

The current Radwaste Three Phase Plan, as described herein, is being implemented at San Onofre Units 2 and 3 to provide an integrated, comprehensive program to improve radwaste system operability and flexibility, correct certain design and operational inadequacies, and provide for adequate radwaste storage and handling.