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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 24, 1992

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: R. Zavadoski

SUBJECT: Hanford Washington Site - DNFSB Technical Staff Report on Radiological and Environmental Safety Programs

1. Purpose: This report documents the technical staff and outside expert report of a trip March 30 - April 3, 1992 to the DOE's Hanford Site at Richland, WA to overview the radiological and environmental protection programs limited primarily to an overview of radiation exposure and contamination control.

2. Summary: During the week of March 30, 1992, Dr. Roger Zavadoski and Mr. James Troan, DNFSB staff members, and an Outside Expert, Dr. James L. Liverman visited Hanford to overview the Radiological Health and Safety programs, in particular, to assess the radiation exposure limitation and contamination control efforts. The visit surfaced some problem areas that warrant attention now as well as providing information about matters for a more detailed review on future visits.

The observations fall into three general categories each of which will be discussed separately:

- Management related issues
- DOE guidance issues, and
- Contamination control

a. Management:

1. Westinghouse Hanford Corporation (WHC) still had not taken action to resolve the issue of permitting eating and drinking within a radiation control area (RCA) in T-Plant which was a matter that the President of WHC had agreed to solve immediately after the October -November visit of DNFSB staff.

2. WHC, particularly in some of its remote facilities, is not giving sufficient attention to standard housekeeping activities that would not only improve the general appearance but would show an improved concern for standard safety practices.

3. There is inadequate planning for many of the important project activities on site. For instance:

Pacific Northwest Laboratory's (PNL) planning related to decontamination and startup of new activities in the Large Hot Cell in Building 324 seem to lack the detail needed to adequately ensure safe operation.

b. DOE Guidance: Guidance to on-site contractors by DOE-RL and DOE-HQ was less than adequate in some cases. For instance:

1. A major area of confusion relates to the establishment of a set of workable guidelines for release of excess materials offsite. WHC finds the guidance of the Secretary of Energy of "not one single atom" of radioactivity will be released to offsite to be irreconcilable with general industry practice. In some cases, such as the receipt and release of commercially acquired bottled gas containers, a container with a

minimum radioactivity that would move in regulated commerce offsite could not be released from Hanford for refill under the current guidance.

2. A number of ORPS reportable incidents have arisen when one of the on-site contractors was carrying out work in another contractor's facility or area. The Team, as a result of reviewing some of these, believes that the lines of authority and responsibility when employees of one contractor work in a facility assigned to a different contractor lack clarity. The guidelines are either not sharply drawn as regards authority/responsibility or the "landlord" role is not being fully accepted, a finding reported by earlier reviewers. Although considerable progress has been made by all contractors, the team believes that as decon work expands this "disharmony" could continue to result in errors and perhaps result in serious injuries to employees. Since DOE-RL has responsibility for all on-site contractors we believe that a stronger oversight by DOE could resolve these areas of conflict.

c. Contamination Control

1. The continuing discovery of areas of contamination not previously observed causes the Team to believe that the inventorying of "hot spots" on Hanford is incomplete and further that some of these areas arise from soil movement from old burial grounds to other parts of the site. This situation suggests that planning and follow-on analysis of methods used for disposal and stabilization of wastes are not being given a sufficiently high priority to assure safe and ultimate disposal.

3. Background: The objectives of the visit were to familiarize DNFSB staff with the nature, extent and current status of the Radiological Protection programs across Hanford and to highlight those areas which will need more attention on later, more detailed, reviews.

These objectives were achieved by:

- Briefings by all on-site contractors on their radiation protection organizations and programs
- Presentations by all on-site contractors on their attempts to control external and internal radiation exposure
- Visits to a number of specific facilities and waste disposal sites.

The Agendas and Attendees are provided in Appendix I. A listing and commentary about topics for future investigation are given in Appendix II.

4. Discussion/Observations: The following discussions/observations are a syntheses of comments about particular subject matter area without regard to the particular order of presentation.

a. Dosimetry:

Discussion - A number of technical and management issues were reviewed for the team. The following are presented here:

1) Dosimetry Measuring System Upgrade. PNL states that it is planned to upgrade the Hanford External Dosimetry System from a unique, but outdated, Hanford system developed in the 1960's to a more sensitive and reliable commercial system. PNL's justifications for the upgrade are highlighted:

- multipurpose dosimetry does not meet low energy beta measurement requirements,
- additional operational time is required to outfit personnel with low energy beta dosimetry on an as-needed basis.

- PNL states that the 1960's technology cannot pass all the requirements of DOE Order 5480.15 - DOE Laboratory Accreditation Program (DOELAP) even though it did pass the 1989 onsite DOELAP technical evaluation.

- The proposed commercial system is much more accurate for measuring neutron activity.

The new commercial system's performance testing is planned for FY93, with implementation planned for January 1994 depending upon:

- continued positive operational testing

- completion of audit of the proposed procurement by the Defense Contractor Audit Agency (DCAA), and

- continued availability of the funds, i.e., funds not lost through local reprogramming.

2) Two general issues related to dosimetry cost were presented:

- Do all employees need dosimetry badges? Currently all employees wear dosimeters whether working in radiation areas or in downtown offices where no radiation is expected. The issue undergoing consideration is a judgment of whether there may be a perception of "less concern for safety" of office workers if dosimeters are taken away. PNL suggested a considerable saving could result by stopping issue & therefore processing of badges of personnel in non radiation areas.

- Because there have been incidents involving removal of personal dosimeters by some employees from the site to their homes where stray radiation (non-occupational) has been detected, the question of a "centralized check in - check out" daily collection of dosimeters is being considered. The presence of a multiplicity of facilities in widely scattered locations clearly will exacerbate logistics of a central location. Whether having a central in-out place at each facility would make such a concept more feasible was not discussed.

TEAM COMMENT:

Dosimetry system upgrade: Since the dosimetry system currently in use has been accredited under DOELAP, and since it complies with all concerns noted during the 1989 onsite DOELAP technical evaluation, the presentation appears to contradict the statement that the 1960's technology cannot pass all the DOELAP tests. Although the specific tests not passed were not discussed it is the Team's view that these issues can be dealt with technically and through modified management procedures and appropriate training perhaps at a considerable saving of resources.

Dosimetry program costs: These items are ones that bear heavily on Management's weighing of alternatives. A site wide coordinated effort, with full involvement of DOE-RL, should see a successful resolution of these matters.

b) Instrumentation Maintenance and Calibration:

Discussion: PNL explained that maintenance of portable radiation detection instruments for the total HAN site was a part of their charter. In discharging this responsibility they had developed regular maintenance schedules with every organization on-site during which these instruments are picked up, processed through maintenance, recalibrated against known standards, and returned to the using organization.

TEAM COMMENT:

Subsequent to the presentation on portable instrument maintenance we visited T-Plant where the Manager of Health Physics for T-Plant explained that T-Plant personnel maintained that facility's Personnel Contamination Monitors (PCM's). Further inquiry showed that each facility is responsible for maintaining its own set of PCM's. This leads to the question of whether comparability and accuracy of PCM's across the site is being monitored by anyone. Clearly if the procedures for calibration are well defined, if the sophisticated instrumentation and certified sources are available and used, and if the personnel are adequately trained there should be no question of validity of the present mode. Since the matter of standardization of procedures for calibration of all non-portable radiation instruments such as air filter monitors, site air monitors, whole body counters, PCM'S etc was not examined the matter of calibration of non-portable radiation equipment should be the subject of a specific inquiry on the next visit.

Another issue that should be addressed on the next visit relates to transportation procedures and accountability for radiation detection instruments with their attached radioactive sources. Particular attention should be given to determining in how far DOT regulations are enforced in the DOE operations both on site and on the public roads crossing the site and whether they are being followed by on site personnel, and where responsibility for overall monitoring of compliance rests.

c. Administrative Limits/Controls of External Radiation at HAN

Discussion: The Administrative Limits/Controls used by contractors at HAN differ somewhat. WHC uses a limit of 300 mr/week and the Westinghouse Radiation Area Management (WRAM) System alerts the management when any badged employee, whether in the Bargaining Unit and/or on the Staff, exceeds this limit. PNL uses 300 mr/week and 500 mr/quarter. The PNL procedure is that the management is alerted when Bargaining Unit personnel reach 80% of this amount. On the other hand, PNL applies the 300 mr/week administrative control only to Bargaining Unit personnel and not to "staff". The 500 mr/quarter is applied uniformly to all of PNL's on-site personnel. KEH apparently follows the same approach as WHC.

TEAM COMMENT:

PNL's use of a the 80% threshold alert provides a vehicle for helping to achieve the management objective of not exceeding the Administrative Limit, thereby avoiding occurrence reporting. The Team believes that this is a procedure to be encouraged for the whole site since an early alert of an individual coming close to the Administrative Limit would be fully in support of the As Low As Reasonably Achievable (ALARA) approach to radiation exposure. On the other hand PNL's application of the 80% alert point for Bargaining Unit personnel and not to its Staff is an uneven application of the rule for which no satisfactory explanation could be elicited. The team believes that DOE should at least consider the adoption of the WRAM or similar approach for administrative control purposes.

d) Application of ALARA at the Hanford Site

Discussion - Contractor personnel expressed the opinion that establishing the low exposure objectives, which is the thrust of ALARA, was going to be difficult to convey. It may be even more difficult to achieve because of the cultural perception that exposures have been considerably lowered below the highs in the past and motivation and methods to go lower was not realistically necessary or achievable.

Further, it was implied in a number of discussions that in actual practice ALARA considerations were often introduced so late in the project planning

process that commitments on dollar levels had conceptually been set. Any modifications to the plan subsequent to this point taking into account greater safety measures were often set aside for expediency, not because these changes wouldn't be valuable but cost/benefit considerations often ruled against seeking the additional funding to accommodate them.

TEAM COMMENT:

ALARA considerations should enter project planning simultaneous with engineering. Alternatives introduced early in the planning process can allow complete evaluation of costs versus benefits of various ALARA alternatives without causing delays or adding costs. Beyond a certain stage of planning, however, attempts to introduce ALARA will likely be viewed as delaying completion, and leading to increased costs. It often happens that attempts to introduce modifications which will improve safety late in the process will be ruled out because of the increased costs. This result is usually brought about because control of the decision process and control of the money rests in the hands of the proponents of the action.

While the team was unable to pinpoint specific instances in which this kind of situation could be verified, we believe a somewhat detailed review of the radiological work practices should reveal the degree to which ALARA is receiving early on consideration and provide a knowledge base to guide further extension to all planning.

e. Visit to T-Plant. The team spent about two hours at the T-Plant site reviewing radiological protection and contamination control. A short presentation was made by the T-Plant Manager and staff which was followed by a guided tour of the facility. The following observations were made.

1) The Westinghouse Radiation Area Management (WRAM) Computer System

Discussion: THE WRAM is a software database containing information about radiation work orders, those authorized to work on the project, equipment used, etc. Information recorded on a plastic card issued to the individual also carries the individual's radiation exposure record etc. WHC uses this card to control access to various parts of the site. The system had been discussed during the morning session and the team asked for a demonstration at the entry to T-Plant.

TEAM OBSERVATIONS:

- When the demonstration of the WRAM System began, the plastic card for identification and entry did not work. The manager presenting the system explained that the system was just being installed in the T-Plant and not all bugs had been worked out. In cases such as this paper documentation and exchange of information on the phone was used as a work-around in the event of out-of-date or incomplete information. A phone call showed that the use of paper documentation is a reasonably immediate fix although delays are caused.

- Because of the lack of clear visibility of the entering hallway at this WRAM location there is reasonably free access to T-Plant's Radiation Control Area (RCA) and command and control of radiological work at this moment relies principally on the worker checking in and out with the WRAM Technician.

TEAM COMMENT: The WRAM Computer System with a properly and currently maintained database should provide a useful tool in the management of exposure of radiation workers. With proper management attention to enforcing the procedures of daily check by use of the WRAM system, workers approaching the compliance limits could be routed to non RCA's until the time was appropriate for their return. Because of the problems outlined

in the two observation above it appears that radiological work could go unchecked by the Health Physics Group.

The Team feels it is important that an operational review be made of the WRAM system throughout the site to see if slow update and malfunctioning of the system, as we observed in T-Building, is an aberration or reflects the true state of this management tool for controlling exposures. Further the Team believes that a review of access control, coordination, accomplishment of radiological work, and exposure control in facilities of all contractors is needed. Such a review requires use of staff fully qualified by the appropriate rad worker training.

2) Poor Housekeeping and Enforcement of Radiation Standards

TEAM OBSERVATIONS: Poor housekeeping practices were noted during a walk-through of the T-Plant gallery. The gallery area was entered through a hallway going past the offices. This gallery, which is a designated RCA, runs parallel with, adjacent to, somewhat above and separate from the canyon area where the highly radioactive materials are found. The first impression upon entering the gallery is one of a place in disorder and disrepair. Although signs clearly designated the area as an RCA there were tables and chairs where breaks could be taken and at which food could be eaten. The gallery area demonstrated a poor state of housekeeping with personnel masks, parts of work clothes and laboratory equipment scattered throughout the areas without any apparent organization. Much of the equipment appeared to be very old and not in use although there were signs that some older equipment had been dismantled.

At one end of the gallery, beyond the offices for gallery workers, was a disorganized storage area with masks, clothes, etc. Immediately beyond this area was a section that was to be converted to a shower-clothes change area. Time was too short to do a more detailed review of location of the change room, its access to the canyon, filtration, etc but our impression was that only limited planning had been done prior to proceeding.

TEAM COMMENT: A matter of some concern is the rather relaxed way answers were made to questions directed at determining the rationale for permitting eating in a RCA which is not in keeping with the most informed practice in Rad Control areas, including WHC's own manual, WHC-CM-4-10.

NOTE: Upon team's return to Washington, DC discussions were held with the DNFSB Staff Hanford Team Leader in which it became clear that the site visit of DNFSB personnel October 28-November 1, 1991 had found almost the identical situation. A trip report resulting from that visit states:

> "T-Plant has made what appears to be an impressive upswing in mission, ownership, standards and culture. Significant improvement is still required however. One example is that T-Plant personnel are eating lunch in a RCA. The President of WHC committed to get this obvious problem fixed immediately."

It is clear that the commitment by the WHC President in early November 1991 (some 5 months ago) to "fix" the problem was not actively monitored either by WHC itself or by DOE-RL. As events have unfolded it seems clear that it has been the staff of DNFSB, not that of WHC or DOE-RL or DOE-HQ, which has twice called attention to this specific problem. The Staff Leader for Hanford followed up on our commentary.

3) Lack of clear markings for various activities.

TEAM OBSERVATIONS:

- During the plant tour it became obvious that spots of radioactive

contamination within the RCA were minimally marked. Although a number of spots on the floors and walls were marked with paint there was no indication of the kinds nor quantities of radiation. Of particular interest was a discolored area at a joint in the building wall which WHC reported was a radioactive area. The source of the radioactivity had not been determined but the view was expressed that it had come from a leak of some sort, perhaps the roof, and further that the area could be covered over and prevent further spread.

- There was incomplete identification of bins into which clean and/or dirty work clothes and personnel equipment had been placed. If there were specific locations for segregation of these materials they were not clearly marked.

TEAM COMMENT:

The above observations lead to a series of questions.

- How complete have been the surveys for contamination in the gallery area and are all known contaminated areas marked? What steps have been taken to determine the source of the radioactivity and has the integrity of the building been checked for source of the water.

- Is there a documented review of the radiological safety practices in T-Plant?

- How closely monitored is the flow of traffic in and out of the canyon areas to
  the RCA and between the RCA and the offices?

- What procedures are in place for insuring separation of clean and dirty gear, and for the issuance of clean gear and collection of dirty?

At this point it is not clear whether the matters discussed above are isolated infractions of good radiological practice or whether they may be reflective of a more general "attitude" toward radiological safety. The Team believes follow up by WHC or DOE-RL is essential.

4) Management of portable radiation detection instruments at T-Plant

TEAM OBSERVATIONS: The T - Plant Health Physics Manager opened the T-Plant's room used for storage of radiation detection instruments. He stated that T-Plant has established its own database to maintain an inventory and tracking system for instruments assigned as well as to ensure timely flow of instruments into PNL's site calibration and maintenance cycle.

TEAM COMMENT: There seems a slight misunderstanding of the respective roles of T - Plant personnel and of PNL's portable instrument maintenance responsibility for the Hanford site since T-Plant says they maintain their own. This apparent conflict will do doubt resolve itself in time.

5) Staging of Radiation Protection Equipment In Emergencies

Discussion - When asked about staging radiation protection equipment outside the storage room for use in an emergency, the WHC technician said that responding to emergencies was a function handled by "Operations" and that radiation measuring equipment was handled separate from his organization. No clear picture emerged concerning what if any coordinating mechanisms would operate to ensure ready availability of radiation detection instruments to Rad Techs in case of an emergency.

TEAM COMMENT It is not clear what lines of authority and responsibility have been established for responding to an emergency situation involving radiation/radioactivity in the T-Plant. The matter of emergency response procedures was not discussed in general in the formal discussion sessions nor at other facilities. Since a number of the onsite facilities are programmed to handle high level radioactivity as the decontamination, and environmental restoration programs accelerate, it is important that this topical area receive an early review. Such a review should take a look at the issue both generically for the site and explicitly for those facilities directly involved in the programs. A review of the adequacy of guidelines for emergency response and that such guidance is being effectively conveyed to personnel who are properly trained are needed.

6) Facility Design Suitability for Future Site Utilization

TEAM OBSERVATIONS: The Manager T-Plant stated that WHC had been authorized to construct a decontamination facility in a "Butler type" building located immediately adjacent to the T-Plant. This facility would be used for low level decontamination of vehicles, smaller pieces of equipment and similar things that could be reused once cleaned. Decon procedures such as sand and/or CO2 blasting, high pressure steam, and other techniques that were effective in decon work would be used. There were no ready answers or surmises as to means of disposal of radioactive effluents, particularly aerosols and water borne contaminants, which would arise from the cleaning operation. The generic response was that old receiving tanks of T-Plant would be used if that was appropriate. Questions of how the materials arising from decontamination activities would be moved to these temporary sites and what if any further disposal was planned did not receive complete answers.

TEAM COMMENT:

The team did not have sufficient time to explore the detailed engineering and operational plans for modification of this facility, nor to inquire into the ultimate handling of wastes generated from the operation. A question remains of the adequacy of planning for this specific structure as well as its operational integration with other T-Plant activities so as to insure safety of the operation. This matter needs further review.

f. BC Site and General Hanford Site Contamination

NOTE: It should be noted that activities on the general Hanford Reservation are in "non-controlled" areas outside building or disposal site perimeter fences. These areas are accessible from the state highways & roads through the site without radiological or security clearances. In part for this reason, things environmental are "watched over" by a diverse group of governmental and public organizations. These "watchers" consist of federal, state, and local government representatives as well as representatives of citizen action groups and representatives of several Indian Nations. The press is also highly active. Among them, activities on the site are generally kept in a state of high visibility.

Not generally observed by such groups however are the kinds of things the team was able to see some of which are outlined below.

1) General "non-controlled" areas.

Discussion: While in transit between fixed facilities the team passed by several areas of the Hanford site in the 100, 200 E & W locations, and the low level commercial waste disposal areas. We observed some of the burial activities where soil stabilization was being carried out and also visited the site where retired nuclear submarine reactor compartment hull sections are being segregated. We passed by but did not visit the low level waste

disposal site managed by U.S. Ecology, however, while driving on an immediately adjacent isolated road a number of newly marked zones of contamination across the road from an old DOE low level waste disposal site were observed.

The team inquired about the nature and comprehensiveness of radioactive contamination on the Hanford site, nature and frequency of surveillance programs, kinds of instrumentation used, how it was determined whether the contamination was there in earlier surveys , or was a new spot and related questions.

Responses to our questions were that contamination was spreading either by wind, water, from fecal droppings of wandering animals having eaten contaminated plants whose roots had reached the buried waste, by blowing of plants that had taken up radioactive materials and similar dispersal means. Additionally, it was added that as more intensive and detailed surveys of land areas are undertaken previously undiscovered sites are being found. Although aircraft had been used on occasion to try to delineate the radioactive areas the instrumentation was too insensitive to detect the low levels of radiation found in these kinds of situations.

TEAM COMMENT: While the general state of the site is being "overseen" by the several groups cited above, the team believes a number of additional steps would further define areas of contamination and prevent further spread. Among these are:

- Severely limit vehicle traffic on non-hardtopped roads to that absolutely necessary to the conduct of business.
- Evaluate the effectiveness of current methods used to stabilize the burial sites and modify them as possible to decrease likelihood of spread.
- Further examine methods for limiting movement of contamination by animals/plants, possibly through use of native plants with a right growth habit which limits penetration of the cover soil to the buried waste below.

g. Waste Transport Pipe between 200 East & 200 West.

TEAM OBSERVATIONS: Further along on the tour past, the U.S. Ecology managed low level burial site, we were shown the location of a 6 inch underground pipe approximately 8 miles long used for high level liquid waste transport between 200 East & 200 West sites. It was stated that as the decon and environmental restoration activities accelerate it will be necessary to transport more waste between these sites. Present thinking seems to be that this line would be reutilized even though soil radioactivity has been found along the trench so it has been assumed this is due to leaks from the pipe. Time limits prevented exploration of what if any studies had been done to determine pipe integrity and to evaluate other options such as building a completely new line.

TEAM COMMENT: On the basis of the information now at hand the team considers it that a detailed evaluation needs to be made of this project prior to the beginning of transfer of highly radioactive materials by its use. The integrity of the underground pipe should be examined using state of the art pipeline methodology to give a baseline of information which could inform a decision about proceeding with transfer. The potential environmental damage from leakage of radioactively contaminated solution into the ground, whether from a leaky tank or a leaky line, is no small matter so it is our belief that activities should be closely monitored whatever the final decisions regarding use.

NOTE: Upon the Team's return to DC we were informed that there is a line item in the 1993 budget to replace the line by 1996.

h. Redox Facility Visit

TEAM OBSERVATIONS:: On the afternoon of April 1, 1992 the site team toured the REDOX Facility which has been shut down since 1967. The facility has been kept in a "safe storage" mode for the intervening 25 years with little sign of removal of equipment, with no identifiable real plans for decontamination and decommissioning and release of that material which might be reclaimed for further use. There seem to be no plans to even begin to collect and assess the kinds and amounts of radioactivity in the heart of the facility, much less to decide what steps could be taken to reduce the possible future hazards in the current mode or when cleanup or disposal begins. It was indicated that the annual costs of keeping the facility in a "non-operational mode" is $2.5 million or more. Some $800,000 is for steam heat alone. Further inquiry did not suggest that either WHC or DOE were considering a total "radiological assessment" of the facility. It seems a necessity to gain a reasonably accurate inventory of the amounts and kinds of contamination prior to seriously considering mode of disposal or disassembly.

TEAM COMMENTS: The team believes that DOE should be encouraged to review facilities on all sites that are being held in a "safe storage" condition with no known future program requirements with a view to reducing to an absolute minimum the annual maintenance costs. Perhaps this actions taken as result of this review would release funds to do slowly the "radiological assessments" for each of the facilities and to address alternative approaches to disposition.

i. Radioactive Material Control & Unconditional Release of Excess Materials

TEAM OBSERVATIONS: The team had asked to examine this program area because of an Occurrence Report showing that some equipment still having "greater than one atom of radioactivity" had been released from on-site for disposal through the 1100 Area "Unconditional Release" pool. As a result of these materials being detected during a spot check in the 1100 Area a survey of all items in the 1100 area was made.

During the presentations a series of questions were raised about definitions of "contaminated", "clean", "mixed waste", "detectability" and related terms since all of these terms come up in connection with cleanup and release to unrestricted use of materials and land.

The criteria for defining an object/material as radioactive is complicated by differentiating between its use on-site, or if it is to be taken off site. Additionally, the alleged DOE Policy of not releasing "one radioactive atom" to the public has been strictly interpreted by some without considering analytical counting system capabilities and/or practices and those in general use in regulated industry. This interpretation has lead to classifying material as not releasable to the public when in fact under regulations applied to the commercial nuclear industry they would have been released.

In the case of materials being checked for release to the public, questions occasionally arise regarding internal or volume contamination in contrast to surface contamination. This question arises specifically in cases where instruments have been used in various situations such that the equipment has the possibility of being contaminated in places inaccessible to measurement without complete disassembly. Potential internal contamination is not routinely clearly marked on systems/equipment and the decision is often made for burial ground disposal as opposed to release to the public. The discussion did not bring out whether matters such as previous use and location of the instrument or of materials were ever

considered in this decision to release or to bury on site.

Related to the above are questions of the category that would be assigned to materials which are sold commercially when they contain a low level of natural radioactivity. A case in point is that of gas cylinders which often show a low level of radioactivity as they come from the vendor. There appears to be no apparent violation of regulations since it is common practice. Under the "not one radioactive atom" guideline apparently in use in DOE these cylinders, once bought, would not be returnable to the vendor even though non-DOE organizations could buy and recycle without question.

A matter related to release questions appeared in a memo from the WHC Manager of Occupational Health and Safety to all staff issued recently saying:

> "I expect all OHS personnel to share in my objective of providing a high (although not absolute) degree of assurance that items given an unconditional release are free
> of detectable contamination. The technical guidance defines measurable detectability as "an increase in count rate (above background) equal to or greater than 100 cpm beta/gamma, and or 20 cpm alpha" using a hand held rate meter."

This guidance is comparable to the regulated nuclear industry guidelines for release of Materials to the public. On the other hand a June 6, 1990 letter from the DOE Secretary has been interpreted by the contractors and DOE-RL to direct that materials in excess of background cannot be released. Both the contractors and DOE-RL realize application of these standards routes a considerable amount of material to the burial ground. We were informed while there that a formal request has been submitted to DOE-HQ to reconsider the current operating mode and to revise the guidance provided to the field. We were not able on short notice to get a copy of the memo that was sent to DOE-HQ.

One of the questions raised by the team concerned the steps being taken to dispose of materials such as used motor oils and other solvents and related materials. The response was that most of the time these were treated as Mixed Products - i.e. might have radioactivity and were therefore to go to the burial grounds. There is some thought being given to preparation of procedures by which such materials could be released.

TEAM COMMENT: Among other matters observed during the visit was that many of the stickers on materials that had been surveyed were unreadable because of sun fading and weathering in general. Such a situation made it difficult if not impossible to determine the status of certification, auditability and accountability. The team considers that the efforts of WHC to develop a sound accountability program would greatly aid the disposal of the excess equipment. Such a program could be of value in determining likelihood of internal contamination of materials which could not otherwise be measured directly.

Another matter which needs attention is the development of a set of criteria for release of materials such as oils and various solvents to the public. Generally the amount of radioactivity is small or non existent and these materials could be released. If they can be safely released for use in the civilian economy the environment would be better served than for them to be buried which would ultimately lead to contamination of the environment and ground waters.

In summary the Team feels that DOE should review the policies in use in the regulated nuclear industry for release of various materials and consider adopting those practices and issue any modifications of DOE directives needed to clarify the DOE intent.

j. Hot Cells in Building 324, 300 Area.

NOTE: The original reason for visiting this particular building at this time was related to the number of Occurrence Reports that have arisen in recent months as well as a need to observe the hot cells in which new work is being initiated. It was hoped there would also be an opportunity to review the status of the HEPA filtration in that building. The HEPA filtration review had to be deferred until the next visit because of time limitations.

1. TEAM OBSERVATIONS: This building has been used extensively in the past for encapsulation of various kinds of fixed sources and for vitrifying high level wastes, including some for West Germany. The building has four hot cells, one considerably larger than the other three.

Two of the smaller cells are used for processing cesium imported from other DOE plants and for its conversion into a form that can be used to fabricate the cesium into fixed sources for use offsite. The methods of handling and processing were explained.

TEAM COMMENT: The path of flow of materials entering and leaving the small cells and the means for control of radiation exposure seem in good order. Although there was a lot of seldom used equipment in the cells the team was assured that all work could be processed thru the area rapidly and safely without the necessity of removing the currently unused equipment.

2) TEAM OBSERVATIONS: The one large cell has been used for many different things. It was built in the earlier days of Hanford to do work which has been discontinued. The cell was built under conditions of extreme urgency with the design being such that the floor of the cell is neither visible from the windows used to observe the activities nor is it reachable with the remote handling equipment in place. The cell is overcrowded with old radioactively contaminated equipment to the point that it has limited usefulness until the equipment is decontaminated and moved out to other locations.

The mission for this cell has undergone a major shift in emphasis so there is a more urgent need for decontamination and removal of the equipment has become more urgent than before. Because the equipment is so large and bulky its physical removal will be through the use of enormous overhead cranes. We did not ask to see detailed plans for decontamination and/or disposal of the equipment nor for plans for physical modification of the facility to overcome the inaccessibility of the floor. Examination of this cell indicates that clean up will be long, involved and costly with there being a constant potential for exposure to very high levels of radiation. Entry to the large cell from the internal hallways seemed to be controlled only by ordinary locks and keys with no interlocking system in place to prevent inadvertent entry since there is present an unshielded source of approaching 3 million curies of Cs and Sr.

TEAM COMMENT: There are a number of questions remaining about the large cell, particularly in relation to the decon, to the removal of bulky equipment, and to the redesign and modification of the cell. We got no real feeling for the methodologies for decontamination of the equipment and the cell and for disposal of the wastes which will arise. Of some importance are the detailed plans for insuring personnel safety since there are over 3 million curies of Cs & Sr present. It was stated, that once all of the "junk" has been removed, personnel from Kaiser Engineering will be doing much of the work which will be carried out in a PNL facility. The Team believes that the constant presence of a highly qualified Health Physicist will be needed to ensure that operations are carried out under the strictest exposure control.

In earlier DNFSB staff visits the question of accepting responsibility for "ownership" of a facility has arisen repeatedly. The point of confluence

of authority and responsibility for safety in situations of one contractor working in another contractor's area has been one of constant conflict resulting in a number of Occurrence Reports. Review of these OR's suggest that these incidents arise either because lines of responsibility are not clearly defined at every step or that there is a lack of acceptance of responsibility on the part of both parties. The Team believes that DOE-RL should review in detail all aspects of the proposed cleanup and facility rework with a focus on ensuring that clear lines of authority and responsibility between the two contractors is totally understood and agreed to. Short of this agreement and understanding, the potential exists for real injury to the workers involved in the activities. The Team is aware of the earlier agreement among contractors and DOE-RL to correct these kinds of matters. It therefore seems that aggressive followup monitoring to determine performance is lax and should be reviewed .

TEAM OBSERVATIONS: As the team was leaving the RCA where the Hot Cells were located we removed shoe covers and lab coats and went thru the PCM, we entered the clothes change area. Adjoining but not cleanly separated from this area was a hand washing station, unisex toilet, and a water fountain.

TEAM COMMENT: While admittedly the seeming lack of clear delineation of areas as encountered in the exit area from the RCA appears not to be significant, when coupled with other observations regarding the large hot cell there seems a need for a complete review of current radiological practices. It seems very important that a fully qualified Health Physicist maintain an active oversight of all activities taking place in the facility.

k. Visit to the Hanford Occurrence Notification Center (ONC).

OBSERVATIONS: This center, although operated by WHC personnel for the whole site, reports directly to the DOE-RL Assistant Manager for Operations in the same manner as do the other operating contractors - WHC, PNL, KEH, and HEHF.

The ONC is the nerve center for tracking status of all OR's under DOE-RL. It is:

- the first point of receipt of information about an occurrence
- responsible for notifying the appropriate personnel on-site, in DOE-RL, and DOE-HQ for all levels of occurrences. For Unusual and Emergency Occurrences it notifies in addition the EPA Washington Regional Office as well as the appropriate offices in the States of Washington and Oregon.
- responsible for maintaining contact with DOE-HQ
- responsible for tracking OR's thru Final Report stage
- responsible for electronic transfer of information on all OR's to the DOE ONC at INEL.
- responsible for monitoring performance of all organizations on timeliness and completeness of reporting occurrences and of tracking status of corrective actions.
- responsible for preparing periodic reports on overall performance as may be directed by DOE-RL Asst Mgr, Operations

An extensive discussion was held with the Director and staff of the ONC getting to
understand the capabilities of the computer search ware to examine various parameters of the database which covers occurrences at all DOE sites. With the search ware in use in the ONC it was possible to ask and get answers

to a series of questions about:

- frequency of OR's by facility, or location in a facility
- kinds of operations involved in generating OR's
- nature of incidents, and root causes.
- by specific elements of the organization, by nature of the incident etc.
- corrective actions taken and timeliness in completion
- Lessons learned, training required to prevent future incidents

These are only a sample of the kinds of questions that can be answered for a single site. It is clear that an individual who became expert in use of the software could be of tremendous help to DNFSB Staff in pinpointing areas of weakness in the operation of a given DOE site thus surfacing those areas at a given site which the visit could most profitably explore.

All DOE sites are required to provide OR's to the INEL DOE wide ONC which in the first 2 years of operation has logged over 10,000 incidents that have occurred on DOE. Approximately 2000 of these have been at the Hanford site. Existence of this database which is continually being updated and expanded as more incidents take place suggest that it could profitably provide a "jumping off" place to obtaining a better insight of which parts of DOE overall operations could most profitably be evaluated.

The ability to analyze the DOE "general level of performance" in various areas - health, safety, environmental restoration, plant and facility operations, planning and execution of its on-site programs, etc could perhaps give a clue of where the DNFSB could have its greatest impact in recommending changes to improve performance in DOE's operations.

5. Future Staff Actions: During the course of the visit a number of items came to our attention but they could not be reviewed because of insufficient time. They are important enough, however, to be on the agenda for future site visits. Among these are:

1. Training. Several instances were encountered where it was clear training was not being given a high enough priority to ensure well trained radiation workers on all programs.
   This is an area much in need of review at an early date.

2. Instrumentation. While PNL seems to be doing a good job in portable instrument calibration and maintenance, we could discern no point of confluence for ensuring adequate performance of the large numbers of non-portable radiation monitors on the site. The adequacy of methods for calibration taken to ensure accurate measurement of radioactivity needs to be reviewed for the bulky PRM's, whole body counters, air monitors and related measuring devices which are specific to each facility and move only with great difficulty.

3. Internal Exposure. There was a detailed presentation on external exposures but the area of internal exposure was given short shrift and should be reviewed for adequate attention to evaluating personnel exposures.

4. ALARA In Practice. While there was some discussion of the principles of ALARA and of how attempts are being made to implement its provisions, the area is of enough importance for a focus on what really is happening throughout the site as a means of gauging the degree of radiological safety concerns.

5. RCA's. While the WHC manual gives general guidance regarding RCA's there seems to be an absence of insistence on following a uniform procedure across the HAN site. Review of the matter could lead to a scientifically sound resolution of the questions of safety that have arisen.

6. Waste Generation Minimization. It was not clear from discussions whether

any thought is being given to alternative ways to decontaminate which would result in the creation of the least possible amount of additional waste while still achieving decon objectives. These considerations have both environment & health as well as cost implications since each additional batch of waste must also be disposed of. After return from the site visit we learned of isolated pockets of activity on the site but no well integrated program seems to exist.

7. Stabilization of Burial Sites. Related to Item 4, is the stabilization of burial grounds and environmental restoration such that any further spread of contamination in soil or above ground is limited as much as possible. Since contamination seems to be continuing to spread this area should be examined. The Team did not visit the U.S. Ecology site specifically although this area should also be examined as a part of the overall picture.

8. Pipeline between 200 E & 200 W. On this visit the movement of highly radioactive wastes thru a pipeline between 200E & 200W was mentioned. Because of the potential environmental and health related impacts that could arise from use of the existing system, this matter should be further investigated.

9. WRAM Control. Our introduction to this program in the T-Building was not a convincing demonstration that this system is working as touted. A detailed review of the actual experience base and effectiveness of this approach to control of exposure of employees is needed. Some consideration needs to be devoted to a uniform rule for exposure for all personnel on the site.

10. Transportation. This subject was touched only peripherally on this trip but there seems a need to review the adequacy of procedures that are in place for the movement of radioactive materials within the site and to offsite areas in particular as regards DOT regulations.

11. HEPA Filtration and Air Monitoring. Our original intent was to spend part of our tour of Bldg 324 on this subject but time did not permit. Because of its increasing importance as decontamination of cells etc begins it should receive a high priority on the next trip.

12. Respiratory Protection Equipment. This area was barely touched upon on this visit, and yet it will be a very important aspect in the decontamination activities. Discussions that were held suggest that there is not an awareness of state of the art equipment in use at other DOE sites although there is acceptance they must look elsewhere for the expertise.

13. Emergency Response Procedures. This matter was only touched upon at T-Plant but the lack of clarity and adequacy of answers to questions suggest that this topic should be explored to determine the actual operational procedures and knowledge about them on the part of personnel.