

September 13, 2002

Mr. Mark Puett  
Manager, Environmental Affairs  
Mallinckrodt Chemical, Inc.  
Mallinckrodt & Second Streets  
P.O. Box 5439  
St. Louis, MO 63147

SUBJECT: NRC INSPECTION 04006563/2002-001(DNMS)  
AND NOTICE OF VIOLATION - MALLINCKRODT

On July 16-17, 2002, the NRC completed the on-site portion of an inspection of activities under your license at the St. Louis, Missouri facility. The purpose of the inspection was to review: 1) Quality Implementing Procedures (QIP's); 2) the procedures supporting the implementation of Final Status Surveys; and 3) general radiation safety practices at the facility to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection, the findings were discussed with you on August 16, 2002.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600. The current Enforcement Policy is included on the NRC's website at [www.nrc.gov/OE](http://www.nrc.gov/OE). The violation involves the licensee's failure to provide adequate training to a technician charged with performing and properly assessing radiological conditions using a radiation survey instrument. The violation is cited in the enclosed Notice of Violation (Notice), and the circumstances surrounding it are described in detail in the subject inspection record.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence is already adequately addressed on the docket in Inspection Record 04006563/2002-001(DNMS). Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

M. Puett

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In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

We will gladly discuss any questions you may have regarding this inspection.

Sincerely,

*/RA/*

Christopher G. Miller , Chief  
Decommissioning Branch

Docket No. 04006563  
License No. STB-401

Enclosure: Notice of Violation

cc w/encl: Eric Gilstrip, State of Missouri Department of Health  
J. Buckley, NMSS

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## NOTICE OF VIOLATION

Mallinckrodt Chemical, Inc.  
St. Louis, Missouri

Docket No. 04006563  
License No. STB-401

During an NRC site inspection conducted on July 16-17, 2002, with continuing NRC review through August 16, 2002, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

Condition 18 of License No. STB-401 states that the Decommissioning of the Columbian and Tantalum (C-T) process buildings shall be done in accordance with the "Phase 1 Plan for C-T Decommissioning" submitted on January 10, 2002.

Section 3.3 of the Phase 1 Plan for C-T Decommissioning states that the contractor will be required to implement the contamination control program with oversight by the Site Radiation Safety Officer.

Section 6.2 states of CT-RP-38 titled "Survey Requirements and Frequencies" states, in part, that the Radiation Protection, Health and Safety Manager ensures those persons performing surveys are appropriately trained.

Contrary to the above, from June 24, 2002 through July 16, 2002, the Radiation Protection, Health and Safety Manager did not ensure that a technician working under CT-RP-38 was appropriately trained. Specifically, the technician was not able to properly read and analyze information from a radiation survey instrument to determine radiological conditions.

This is a Severity Level IV violation (Supplement VI).

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence and the date when full compliance will be achieved is already adequately addressed on the docket in Inspection Record 04006563/2002-001(DNMS) as described to the inspectors on July 17, 2002. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy the Regional Administrator, Region III within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 13th day of September 2002

APPENDIX A

MATERIALS DECOMMISSIONING INSPECTION FIELD NOTES  
FOR FACILITIES NEEDING SIGNIFICANT DECOMMISSIONING EFFORT

Region III

Inspection Report No. 040-06563/2002-001  
License No. STB-401  
Docket No. 040-06563

Licensee (Name & Address) Mallinckrodt Chemical, Inc.  
Mallinckrodt & Second Streets  
P.O. Box 5439  
St. Louis, Missouri 63147

Licensee Contact Mark Puett, Environmental Affairs Manager  
Telephone No. (314)-654-1344

Date of Last Inspection July 25, 2001  
Date of This Inspection July 16-17, 2002 with continuing NRC review through  
August 16, 2002  
Date of Next Inspection Estimate - September-October 2002

Type of Inspection:  Announced  Unannounced  
 Routine  Special  
 Initial Decomm.  Reinspection of Decomm.

Brief Description of Inspection Activities:

Mallinckrodt was first issued License No. STB-401 on June 26, 1964, for the processing of ore to extract Columbium and Tantalum (CT). The license authorized the possession of thorium and uranium in natural or synthetic ores up to 30,000 kg of each. The license was utilizing the Plant 5 facilities until October 1985. After 1985, the licensee discontinued the processing of ores and the facility was placed in a standby status. The licensee's contractor packaged and shipped drums containing processing residues to an authorized radioactive waste disposal facility and conducted a general cleanup of Plant 5 buildings during 1992. The cleanup consisted of removing and cleaning debris from the floor of the buildings and drumming the material for waste disposal. Contaminated equipment was either packed for disposal or left in the buildings to be addressed during future decommissioning activities. The licensee conducted a radiological characterization of the Plant 5 area from September 1994 to March 1995.

The licensee submitted a Decommissioning Plan (DP) for the CT Decommissioning Project (CTDP) to the NRC on November 11, 1997. The licensee will submit the CTDP in two parts because the licensee will conduct the C-T decommissioning project in two phases. The licensee's Phase one plan will consist of decommissioning the buildings and equipment. To the extent that whatever remains on-site, the licensee will be releasing buildings and equipment for unrestricted use based on an industrial use scenario. Phase two will complete the decommissioning of the building slabs and foundations, paved surfaces, and all subsurface materials to the extent that the licensee can release them for restricted use.

In addition to the CTD, the U.S. Army Corps of Engineers is performing remediation of radiological contaminants in other areas of the St. Louis Plant (USACE) under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

The licensee submitted a January 18, 2001 revision to its initial Phase 1 submission. In addition to this routine inspection, the NRC conducted general discussion with the licensee and its consultants regarding the CTD.

The NRC approved the licensee's Decommissioning of the C-T process Phase 1 plan on January 10, 2002 with two revisions submitted on February 13, 2002 and March 8, 2002.

**Brief Description of Findings and Action:**

During the inspection, the NRC reviewed three areas. These were a review of: 1) the licensee's Quality Implementing Procedures (QIP's); 2) the procedures supporting the implementation of MARSSIM Final Status Surveys; and 3) general radiation safety practices at the facility.

The inspectors identified seven (7) unresolved items and one observation during the QIP review, 40 findings during the MARSSIM Final Status Surveys review; and one (1) violation of NRC requirements and two (2) findings during the review of the general radiation safety practices at the facility.

**Summary of Findings and Action:**

- No violations cited, clear NRC Form 591 or regional letter issued
- Violation(s), clear NRC Form 591 issued
- Violation(s), regional letter issued
- Followup on previous violations

Inspector:     /RA/      
Michael LaFranzo; Radiation Specialist

Date:     09/11/02    

Inspector:     /RA via email/      
John Buckley; Project Manager

Date:     8/19/02    

Inspector:     /RA via email/      
Jean-Claude Dehmel; Health Physicist

Date:     9/10/02    

Approved:     /RA/      
Chris Miller; Chief, Decommissioning Branch

Date:     9/18/02

[Field notes are to be used by the inspector to assist with the performance of the inspection. Note that all areas indicated in the field notes are not required to be addressed during each inspection. However, for those areas not covered during the inspection, a notation ("Not Reviewed") should be made in each section where applicable. Additionally, all areas covered during the inspection should be documented in sufficient detail to describe what activities and/or records the inspector observed. The fieldnotes to the "Decommissioning Inspection Procedure for Materials Licensees" should be supplemented with: (1) the applicable inspection procedures for operating facilities provided in the Inspection Procedure (IP) 87100 series; and (2) other written documentation of the inspection, as necessary.]

## 1. SUMMARY OF DECOMMISSIONING STATUS

The checklist below is intended to provide, in a written outline format, summary documentation of the status of the licensee's facility in the decommissioning process. This documentation will be filed as part of the inspection report. The inspector should use this information to develop each inspection plan(s) for the various stages of decommissioning, namely, before dismantlement, during dismantlement and site remediation, and after site remediation.

- |    |   |             |
|----|---|-------------|
| A. | Licensee ceased operational program.  | (X) Y ( ) N |
| B. | Required decommissioning financial assurance mechanisms in place.             | (X) Y ( ) N |
| C. | Decommissioning Plan (DP) required.   | (X) Y ( ) N |
| D. | Licensee final survey required.   | (X) Y ( ) N |
| E. | NRC confirmatory survey required.   | (X) Y ( ) N |
| F. | NRC closeout inspection required.   | (X) Y ( ) N |
| G. | Licensee doing decommissioning planning and preparation before dismantlement. | (X) Y ( ) N |
| H. | Licensee actively remediating site.   | (X) Y ( ) N |
| I. | Licensee completed site remediation.  | ( ) Y (X) N |

### Description of Facility Status:

Phase 1 Decommissioning Plan was approved earlier in 2002. The licensee is currently in the process of dismantling buildings. The licensee believes that building dismantlement will be complete before January 2003. During the inspection, the licensee was removing piping from the facility that contains asbestos and radioactive material. Asbestos removal from radiological contaminated buildings was ongoing during the inspection.

A large quantity of material that is radiologically contaminated is in a few buildings. The licensee plans to remove the contamination while buildings are being dismantled. In addition, the licensee has scheduled the roofs of buildings contaminated with radioactive material not in Plant 5 to be removed and replaced this year as well.

## 2. INSPECTION OF KEY DECOMMISSIONING ACTIVITIES

The following is a generic checklist of major licensee activities occurring at various stages of decommissioning. From this generic checklist and from facility-specific activities you identify, develop the set of licensee activities to be inspected - for each individual inspection throughout the decommissioning process. Plan to inspect licensee activities that present potential high-risk conditions. Then apply the standard health and safety inspection areas in Section 3 of these fieldnotes (taken from the applicable 87100 series IP for the licensee's operational program) to the specific licensee decommissioning activities that are being inspected.

To complete the licensee activities checklist, the inspector will need to obtain information from the Licensing Project Manager, review the DP, make observations at the licensee's facility, review licensee records, take measurements and samples of contaminants, and undertake other investigative measures, to determine whether the licensee is meeting all regulatory and DP commitments for each decommissioning activity the licensee is performing.

A. LICENSEE ACTIVITIES INSPECTED BEFORE DISMANTLEMENT

- |   |              |
|---|--------------|
| 1. Licensed material used during operations has been removed from site.   | (Y) Y ( ) N  |
| 2. Facility license conditions are in place and met by licensee.  | (X) Y ( ) N  |
| 3. Site security and control of contaminated material being maintained in compliance with 10 CFR 20.1801 and 20.1802.   | (X) Y ( ) N  |
| 4. Support systems and services (e.g., lighting, water supply) are in place.  | (X) Y ( ) N  |
| 5. Decommissioning schedules are consistent with timeliness requirements in 10 CFR 30.36, 40.42, and 70.38.   | (X) Y ( ) N  |
| 6. Licensee's recordkeeping is consistent with 10 CFR 30.35, 40.36, and 70.25.  | (X) Y ( ) N  |
| 7. Financial assurance requirements are being maintained in accordance with 10 CFR 30.35, 40.36, and 70.25.   | ( ) Y (X) NR |
| 8. Licensee is conducting site characterization in accordance with applicable radiation protection procedures.  | (X) Y ( ) N  |
| 9. Construction of new site features (e.g., roads, rail spurs, staging areas, sediment control ponds) conforms to DP and does not compromise health and safety of workers and public. | (X) Y ( ) N  |
| 10. Licensee activities conform to specific license conditions and licensee programs and procedures.  | (X) Y ( ) N  |

Basis for Findings:

The licensee's facility is still an active and fully functional industrial site. Buildings that the licensee is utilizing for chemical production operations surround plant five. Therefore, the licensee is constantly monitoring decommissioning and plant operations to ensure industrial hazards do not occur.

As part of the NRC's ongoing inspection activities, the inspectors reviewed seven procedures supporting the implementation of MARSSIM Final Status Surveys.

The selected procedures are listed below. The NRC's review indicated that some technical elements of the procedures were internally inconsistent with some requirements of the Decommissioning Plan (DP) and MARSSIM. The NRC identified the following items during the review:

a. CT-RP-26, Rev. 0 - Radiation Protection Training

The HP Technician's qualification matrix (Attachment 26-3) requires mandatory FSS training (under HP Task No. 21) only for Senior HP technicians and only optional for Junior HP Technicians. However, the licensee may conduct FSS under the direction or

supervision of the Senior HP Technician (Attachment 26-2). However, the NRC expects that in practice Junior HP Technicians will conduct most of the FSSs and, consequently, providing direction and supervision to multiple surveys being conducted simultaneously at different locations will be impractical for the Senior HP Technician. Surveys conducted under such conditions may later complicate the review of final status survey reports by NRC staff due to questions regarding the validity of the survey.

b. CT-RP-36, Rev. 1 - Unconditional Release of Materials and Equipment

In defining the scope, the discussion of Section 2.1 (p.2 of 11) does not apply to volumetrically contaminated materials and instead the section should refer the reader to Section 2.2.4 of the DP for specific requirements. The unconditional release criteria presented in Table 5-1 (p.3 of 11) of the procedure are only for surface contaminated items. The procedure needs clarification to ensure that volumetrically contaminated materials are not inadvertently released by using the wrong process and release criteria.

One of the footnotes (either "a" or "b") to Table 5-1 (p.3 of 11) needs to refer the reader to the requirements of Section 5.2 of Appendix H to the DP for specific details. Section 5.2 addresses considerations for surface efficiency and surveys conducted on items with coatings that would shield alpha particles.

c. CT-RP-39, Rev. 1 - Performance of Radiation, Contamination, and Airborne Radioactivity Surveys

The procedure attempts to cover the requirements for the full range of surveys (e.g., radiation protection, environmental monitoring, and FSS) expected to be conducted during Phase I remediation activities. The inspector's review indicates that the sections of the procedure addressing the conduct of FSS simply refer the reader to instructions and requirements identified in the FSS Plan developed for each survey unit. However, a review of the first FSS Plan prepared for survey unit No. 2501-1 indicates that the document refers the user to this procedure for details on how to conduct such surveys. Accordingly, neither the FSS Plan nor CT-RP-39 clearly presents detailed guidance through such circuitous referencing. Given that the conduct of FSS addresses requirements that are unique and have different objectives than surveys conducted for radiation protection purposes or environmental monitoring, the requirements for FSS should be presented in a separate section of this procedure, or, alternatively, be contained in a separate procedure that is solely devoted to this subject.

The references (Section 3, p.2 of 19) did not, but should, include the FSS Design Guide and the FSS Plan to the existing list.

Section 7.1.2 (p. 5 of 19) does not identify which sections and tables of the DP the licensee is referring to in identifying instrumentation detection limits. Note that the DP presents three tables with instrumentation detection limits, that is Table 3-2 in Section 3, and Tables 4-1 and 4-2 in Section 4. In addition, the section does not state whether the corresponding list maintained by the Radiation Protection Health and Safety (RPHS) Manager supersedes the instrumentation detection limits presented in the DP.

In Section 7.2.4 (p. 9 of 19), the steps should refer the user to the FSS Plan to comply with the requirements for removable surface activity, that is not to exceed 20% of the Derived Concentration Guideline Levels (DCGL) based on the conditions identified in Attachment C (Section 3.10, p.C-7) of the DP.

A comparison of Attachment 39-1 (p.17 of 19) as documented in this procedure against Attachment C to the FSS Plan prepared for survey unit No. 2501-1 indicates that the origin

of the final status survey forms presented in the FSS Survey Plan is not documented, but should be, in a procedure or the FSS Design Guide. The survey forms as mentioned above include the FSS Direct Measurement Survey Form, the FSS Scan Measurement Survey Form, and the FSS Supplemental Data Request Form.

d. CT-RP-40, Rev. 1 - Survey Documentation and Review

Section 3, p. 2 of 7 does not, but should, include the DP, the FSS Design Guide, and the FSS Plan to the list.

In addressing survey distribution and review of completed survey forms, Section 7.3 (p. 5 of 7) does not, but should, address specific requirements for final status surveys. Specifically, the section does not provide clear instructions on the processing and review of FSS, which have different objectives than routine radiation protection surveys. As written, the focus is on the requirements for other types of surveys (namely radiation protection and environmental monitoring).

e. CT-RP-66, Rev. 1 - Operation of Scalers, Ratemeters, and Contamination Detectors

In defining the scope, Section 2.1.1 (p. 2 of 22) does not, but should, state that the procedure does not apply to the survey of volumetrically contaminated materials. However, the licensee addresses the specific requirements in Section 2.2.4 of the DP for specific requirements. The document needs clarification to ensure that volumetrically contaminated materials are not inadvertently released using the incorrect process.

Section 7.6.3.2 (p. 11 of 22) does not, but should, address radiation detection instrumentation failing daily source checks. Specifically, the section does not address whether any of the prior survey measurements need to be discarded and conducted again or if the instruments need to be recalibrated. As written, the discussion only addresses the role of the RPHS Manager in evaluating the results of failed daily source checks and deciding whether to reject or accept the results.

In Sect. 7.10.3 (p. 14 of 22), one term of the equation is missing (surface efficiency,  $\xi_s$ ). In addition, the nomenclature and method used to calculate the area density of surface activity does not match with Section 3 of App. D of the DP and NEXTEP Memorandum dated July 16, 2002 (Basis for Detector Sensitivity for Mallinckrodt C-T Project). Such changes should be checked against the corresponding algorithm used in the Final Status Survey Database to ensure that they are the same.

Section 7.10.5 (p.15 of 22) does not, but should, address periodic instrumentation response checks for detector efficiency and effective area of detectors used for the FSS. Specifically, the section does not indicate that the instrumentation calibrated by a facility or manufacturer was using flood sources. Rather, the section mentions that periodic instrumentation response checks will be conducted onsite using electroplated disc sources instead. In addition, the section should refer to the DP (Attachment D and H) and NEXTEP Memorandum dated July 16, 2002 (Basis for Detector Sensitivity for Mallinckrodt C-T Project) in deriving the appropriate efficiency for the detector being used. A review of the memo and Sect. 3 of App. D indicates that the equation terms and nomenclature are inconsistent.

Section 7.11.3 (p.17/18 of 22) does not, but should, discuss the beta detector efficiency, as compared with the response of a reference detector as documented in the DP (Attachment D and H) and NEXTEP Memorandum dated July 16, 2002 (Basis for Detector Sensitivity for Mallinckrodt C-T Project). A review of the memo and Section 3 of Appendix D indicates that the equation terms and nomenclature are inconsistent.

f. CT-QA-4.1, Rev. 1 - Instructions and Procedures

In defining the scope, the discussion in Section 2.1 (p.2 of 6) needs to state that it does apply to the design of FSS Plan and conduct of final status surveys. Accordingly, the references (Sect. 3, p.2 of 6) need to include the DP, the FSS Design Guide, and the FSS Plan for completeness.

g. CT-QA-6.1, Rev. 2 - Calibration and Control of Measuring and Survey Equipment

Section 7.1.1 (p.3/4 of 10) is not clear regarding the readiness of survey instrumentation. Specifically, the procedural steps do not indicate that in some instances, instruments are made up of multiple components that the units must be calibrated and operated as a matched set.

Section 7.4.2 (p.5 of 10) does not, but should, address the use of instrumentation under suspect conditions. Specifically, the section only addresses a decision on whether to reject or accept the results and not regarding whether any of the prior survey measurement results need to be discarded and conducted over again.

In Attachment 6.1-2 (p.10 of 10), the steps for deriving lower limit of detections for survey instrumentation are not consistent with Attachment D (p. D-17) of the DP. As written in Attachment 6.1-2, the steps omit to address possible extraneous responses of the AB-100 or 43-89 gas proportional detectors to ambient gamma radiation. Under such conditions, a need may exist to re-derive the lower limit of detection and determine whether the new detection limits meet the survey design objectives.

## 1.2 Final Status Survey Design Guide

The licensee has prepared a Final Status Survey Design Guide using the elements identified in Sect. 4.6 of the DP. The NRC reviewed the version dated July 14, 2002, Rev. 1 during the inspection. The FSS Design Guide provides further elaboration on design consideration topics from that covered in the DP (Sect. 4.6). Also, the FSS Design Guide now includes an administrative release limit as an ALARA goal. However, during a review of the FSS Design Guide, the inspectors identified the following items:

- a. The introduction (p.3 of 28) did not note that the FSS Design Guide is a document originating from the DP, that the FSS Design Guide will be revised periodically to reflect the collective knowledge gained over Phase I remediation activities, and that revisions to the FSS Design Guide will be conducted in accordance with DP requirements (Section 2 and Administrative Control Plan, Attachment 2).
- b. A review of Section 1.4.2 (p.4 of 28) indicates that two DP conditions are missing and another one is not consistent with its counterpart cited in the DP. The inspectors review identified that Section 1.4.2 (p. 4. of 28) is inconsistent with the DP. Specifically, items "g." and "k." of Section 2.6 of the DP were not part of Section 1.4.2. Item "g." addresses changes in derived concentration guideline levels and related scan and fixed MDCs. Item "k" places a condition against downgrading the classification of survey units. In addition, Section 1.4.2.1 does not qualify the requirement in changing the Type I decision error rate to be consistent with Sect. 4.4.4 of the DP (p.4-10). In general, the NRC expects the initial target value for the error rate is 0.05 and cannot exceed 0.15.
- c. Section 2.2.3 (p.5 of 28) is not, but should be, consistent with DP Section 4.6.3 (p. 4-31). Specifically, the licensee did not include "paint and/or coated surfaces" in Section 2.2.3.
- d. Section 2.4.6 is not, but should be, consistent with the DP. Specifically, the DP indicates that specifications to all fixed measurements are based on a "random start and systematic"

grid to be consistent with the DP. As written, the Section 2.2.3 only refers to the use of “systematic” measurements.

- e. The designation and physical boundaries of FSS survey units are different from those described in Attachment A of the DP. In addition, the section does not require that any differences be described and are not included in the FSS report. The DP should note that the difference may be attributed to the final configurations mandated by remediation activities and survey design considerations. In addition, the DP should note that any differences should be described and included in the FSS report.
- f. Footnote “11” to Section 3.9 (p.8 of 28) does not, but should, address the maximum paint thickness as defined in Appendix D of the DP. Without this qualifier, the footnote could be interpreted to apply to any number of paint coatings with yet different beta particle attenuation properties. For types of paints not described in the DP or characterized by other attenuation properties, the DP requires that the detectable beta fraction be derived anew.
- g. The licensee has not addressed the requirement of Section 4.1.4 (p.9 of 28) in the Final Status Survey Database. The NRC believes that addressing this issue will act as a flag to ensure that a survey unit meeting this criterion is reconsidered as to its classification, whether the results are within the specified fraction of the  $DCGL_w$ , and whether the size of the survey unit has changed and needs to be identified as a new one and evaluated separately.
- h. Table 4.2 (p.11 of 28) does not, but should, refer the reader to other requirements of the DP, that is Section 4.4.8.4 (p.4 of 23) and Footnote No. 25 (p. 4 of 24). The requirements noted in this concern address the determination of background reference areas and number of background measurements, which should be determined using the guidance of NUREG-1505 and App. E to NUREG-1727.
- i. Footnotes No. 23 and 24 on the bottom of p.15 of 28 refer the reader to the wrong section of the FSS Design Guide. The appropriate section should be Section 2.4 instead of 2.7.
- j. The discussion in Section 5.4.5 (p.16 of 28) on the upper limit of the elevated measurements comparison (EMC) test and an area factor is inconsistent with that of the DP (App. C, p.C-10). The FSS Design Guide caps the area factor to a value of 12, while the DP limits it to 10. The licensee should reconcile this difference. In addition, the licensee should expand the requirements to include the sum-of-the-fraction rule of eq. 8.2 of MARSSIM or eq. E1 in App. E of NUREG-1727.
- k. Section 7.2.3 (p.19 of 28) addressing the conduct of measurements in covered or hidden areas should include further technical elaboration. The Section does not, but should, address the conditions of the survey unit where the licensee takes samples at alternate locations (e.g., using professional judgment or a bias scheme) and the current conditions of the obstructions and alternate sampling or measurement locations in the FSS Design Guide.
- l. Section 7.3.8, p.23 of 28) does not, but should, acknowledge the possibility that radioactivity might be sandwiched in one or more layers of roofing tar. The discussions should inform the reader that this possibility needs to be considered unless building maintenance records indicate otherwise. If it were determined that contamination was present or suspected in roofing tar, the section should address specific considerations in the choice of the measurement system and/or sampling methods.
- m. The method in Section 9, p.26/27 of 28 used to calculate the area density of surface activity is not consistent, but should be, with Section 3 of Appendix D of the DP and NEXTEP Memorandum dated July 16, 2002 (Basis for Detector Sensitivity for Mallinckrodt C-T

Project). In addition, the revision should be checked against the corresponding algorithm used in the Final Status Survey Database to ensure that they are the same.

### 1.3 Final Status Survey Plan for Survey Unit 2501-1

The licensee has prepared its first final status survey plan (FSSP) for a survey unit in Building 250 (No. 2501-1, dated July 14, 2002). The inspectors reviewed the FSSP and identified the following items:

- a. The designation and physical boundaries of the survey unit shown in Tables 2-1 and 2-2 (p.4/5 of 23) and Attachment A of the FSSP (p.15 of 23) are different from the ones described in Attachment A of the DP (p.A-18). Specifically, there are inconsistencies in the above documents that may need further explanation for any differences in the definition of boundaries and room designations of the survey unit. In addition, the descriptions appear to omit some areas and include others not listed in Appendix A of the DP.
- b. The surface area units in Table 2-1 (p.4 of 23) are inconsistent with the FSS Design Guide, and MARSSIM nomenclature. Specifically, the Table uses square feet where the other documents use square meters.
- c. Footnote "a" to Table 2-4 (Release Criteria) does not reflect that the maximum paint thickness is limited to a maximum of four coatings with beta particle attenuation properties defined in Appendix D of the DP. Without this qualifier, an individual could interpret the footnote to apply to any number of paint coatings or paints with other beta attenuation properties. For types of paints not described in the DP or characterized by other attenuation properties, the DP requires that the detectable beta fraction be derived anew.
- d. The release criteria (Table 2-4, p.6 of 23) does not refer to the FSS Plan in demonstrating compliance with the requirements for removable surface activity, i.e., not to exceed 20% of the DCGL based on the conditions identified in the DP, Attachment C (Section 3.10, p.C-7).
- e. The background reference data presented in Table 2-6 does not address the source of the values and factors used to convert from beta per minute per 100 cm<sup>2</sup> to disintegration per minute per 100 cm<sup>2</sup>, as based from Table 4-3 of the DP (p.4-5). If the values are not from Table 4-3, a similar comparison with the data of Table 4-3 of the DP may be necessary to ensure consistency.
- f. Section 2.4.8 or 3.1.3 are not consistent with the DP and the FSS Design Guide. Specifically, fixed measurements are not based on a "random start and systematic" pattern or grid.
- g. Parameters used to derive the relative shift were not, but should be, addressed in the DQO input parameters listed in Table 3-1 (p.10 of 23) concerning the development of the specifications for any survey unit. In addition, the DQO does not indicate, but should, that the above approach is a default design, and, alternatively, actual data from the survey unit may be substituted in deriving the relative shift as conditions warrant to ensure an appropriate sampling density.
- h. The total number of data points between Section 3.1.3 (p.10 of 23) and Table 3-2 (p.12 of 23) is inconsistent. Specifically, Section 3.1.3 states that 29 are required and Table 3-2 specifies 36. In addition, a technical basis is required if the difference in the number of samples is valid to address specific physical configurations of the survey unit.

### 1.4 Final Status Survey Database

Project personnel (NEXTEP staff) provided a demonstration of the computerized database (using a "beta" version of the software) that will be used to evaluate FFS results and demonstrate compliance with the cleanup criteria. The demonstration addressed the software platform, file structures, data input using pre formatted tables and queries, output screens showing results, use of built-in flags in checking data entries, a date-entry process relying on 100% verification, and data evaluation against the site-specific cleanup criteria. Project personnel indicated that some features being demonstrated are still in developmental stages, have not yet been fully tested, and the software program still needs validation by the licensee. In addition, a user's manual still needs to be prepared to reflect the final operational features of the program and its database management system. Finally, a training program has yet to be developed and administered to all potential users. The NRC will evaluate these and related items in a future inspection once the licensee has finalized and validated the software package, and the user's manual is available for NRC review. The NRC intends to independently test the software package using its own mock test data.

### 1.5 Onsite Field Radiological Laboratory

Project personnel (NEXTEP staff) provided a walk-through of the field radiological laboratory being setup to support Phase I remediation activities. The licensee will use the laboratory for evaluating radioactivity levels in samples collected in support of the implementation of the radiation protection program, environmental monitoring program, waste characterization and segregation for disposal purposes, and conduct of final status surveys. In the context of final status surveys (FSS), the laboratory equipment is still in the process of being setup and calibrated. The licensee has yet to finalize and approve procedures. In addition, the licensee has not administered training to designated users. The laboratory is being setup with instrumentation that will provide the capability to perform low resolution alpha, beta and gamma spectroscopy. The systems being assembled include a surface barrier detector and Na(I) and beta scintillation detectors, all operated via personal computers. Other bench-top instrumentation included alpha/beta scalers and an automatic gas-flow proportional counter. The laboratory possessed a number of calibration standards, including KCl, U<sub>3</sub>O<sub>8</sub>, and Th as bulk liquids and powders; and Th-230, Tc-99, and Sr-90/Y-90 as electroplated discs. The standards included NIST-traceable certificates issued by the suppliers.

Other instrumentation used to conduct FSS were noted by the NRC to include portable survey meters connected to gas-flow proportional and G-M probes, and micro-R-meters to measure ambient gamma radiation. The NRC found the list of equipment to be consistent with that indicated in the DP, while the commitment to use low resolution alpha, beta and gamma spectroscopy systems and a surface barrier detector was noted to be an augmentation of analytical capabilities.

Project personnel indicated that analytical capabilities are still in developmental stages, and have not been fully tested or calibrated, and the computer programs still need to be validated. In addition, user's manuals and procedures still need to be prepared and approved. The NRC will evaluate these and related items in a future inspection once the instrumentation is fully operational and calibrated, the supporting software packages have been validated, and procedures and user's manuals are available to the NRC. The NRC intends to independently test the validity of sample results analyzed onsite using the services of its own contractor (ORISE, Oak Ridge, TN).

The inspectors review of this program was to ensure that NRC had an opportunity to review the program prior to implementation. The NRC will review the above findings and the licensee's actions concerning those findings, if any, during future inspections and/or licensing actions.

## B. LICENSEE ACTIVITIES INSPECTED DURING DECONTAMINATION, DISMANTLEMENT, AND SITE REMEDIATION

- 0.1 Site security and control of contaminated material being maintained in compliance with 10 CFR Part 20. (X) Y ( ) N
- 0.2 Decontamination and dismantlement of structures are being performed consistent with DP and sound industry practice (structures include buildings, utilities, treatment lagoons, etc.). See Below

3. Decontamination and remediation of the following are being performed consistent with DP and sound industry practice:

- a. Soil. ( ) Y ( ) N
- b. Sediment. ( ) Y ( ) N
- c. Surface waters. ( ) Y ( ) N
- d. Groundwater. ( ) Y ( ) N
- e. Other mediums: ( ) Y ( ) N

Phase 2 of the Decommissioning Plan will address the above areas. Currently, the licensee is working on providing NRC with the Phase 2 plans.

4. Licensee release and disposal of decommissioning wastes are consistent with DP and approved by NRC for:

- a. Liquid wastes (e.g., groundwater, surface water, liquid from treatment ponds, process liquids). ( ) Y (X) NR
- b. Solid wastes (e.g., building materials, process and other facility equipment, concrete rubble, soil). (X) Y ( ) N
- c. Other wastes: ( ) Y ( ) N

5. Temporary, on-site storage of low-level radioactive wastes from decommissioning meets license conditions and guidance in IP 84890. (X) Y ( ) N

6. Packaging and shipment of radioactive waste materials meet requirements in 40 CFR Parts 173-178 and 10 CFR Part 71. ( ) Y (X) NR

7. Restoration of site - Licensee has restored site to meet license conditions and NRC-approved plans. ( ) Y ( ) N

8. Licensee survey of material and equipment for free release sufficient to demonstrate compliance with release criteria.

**Basis for Findings:**

At the time of the inspection, the licensee did not possess procedures to address the shipment of radioactive waste off-site. The licensee's last shipment of waste was performed by an

independent contractor, Shaw Inc. in May 2002. The contractor generated the waste as a result of contamination located on the roof of building 204. The contractor transported the contaminated material to an authorized entity and the building has since been demolished.

NRC approved Mallinckrodt's Phase 1 DP dated January 10, 2002. Section 5 of the DP, "Quality Assurance", requires that Mallinckrodt develop Quality Implementing Procedures (QIPs) to "provide step-by-step details for complying with project QA requirements." The NRC staff did not review and approve QIPs during its review of the DP. Instead, it is the staff's intention to evaluate Mallinckrodt's QIPs during routine inspections.

Mallinckrodt has the following 11 quality assurance QIPs:

- CT-QA-3.1 Precision Equipment and Services-Procurement Document Control;
- CT-QA-3.2 Chain of Custody;
- CT-QA-4.1 Instructions and Procedures;
- CT-QA-4.2 Calculations;
- CT-QA-5.1 Document Control;
- CT-QA-6.1 Calibration & Control of Measuring and Safety Equipment;
- CT-QA-7.1 Internal Audits;
- CT-QA-7.2 Inspection & Surveillance;
- CT-QA-9.1 Corrective Action Request;
- CT-QA-9.2 Stop Work Orders; and
- CT-QA-10.1 Quality Assurance Records.

In order to evaluate implementation of these procedures, the inspectors reviewed several QIPs, and examined the activities associated with four tasks:

- (1) HP-13, Performance of Routine Radiation Surveys;
- (2) HP-14, Performance of Routine Contamination Surveys;
- (3) HP-21, Operation and use of modified RP instrumentation for Final Status Surveys; and
- (4) HP-26, Operation of Environmental Air Samplers.

Based on the inspectors examination of the above tasks and a review of several QIPs, the inspectors identified the following six unresolved items.

#### Unresolved Item 1

Referencing CT-QA-4.1, Section 6 has many procedures that have "effective dates" which precede the procedure approval dates by the executors. Specifically, Section 6.2.2 states that, "Directives will be published by transmittal when final approval signatures have been obtained from the executors . . ." All 11 QA procedures have effective dates that precede the final approval date of the Mallinckrodt Project Manager.

#### Unresolved Item 2

Referencing CT-QA-4.2, Section 7.1 does not possess information that includes; (1) identification of the issues resulting from calculation errors; and (2) assumptions that affect the calculation. Specifically, the inspectors examined four calculations for compliance with the procedure; (1) Decay Corrected Source Activities, (2) Minimum Detectable Activity Determination, (3) Tennelec 5100 Calibration Sheet, and (4) CT-RP-66 Chi Squared Spreadsheet. The procedures above did not possess the above information necessary to ensure compliance with industry standards and NRC requirements. Therefore, the NRC determined the licensee had not met Sections 7.1.1 and 7.1.2 of the procedure.

#### Unresolved Item 3

Referencing CT-QA-5.1, Section 1, Mallinckrodt does not treat the approved DP as a controlled document. Specifically, Section 1.1 of the Document Control procedure states that the purpose of the procedure is to, "Establish a procedure for the change, distribution and control of project directives (i.e. written procedures, field instructions, safety work permits (SWPs), and drawings) - to ensure that only current documents are being used to project personnel." Since the DP is not a controlled document, the NRC did not find evidence that Mallinckrodt personnel are working in accordance with the approved DP.

#### Unresolved Item 4

Referencing CT-QA-6.1, Section 7.1, Measuring and Survey equipment does not have appropriate calibration stickers. Specifically, Section 7.1.1.3 of the procedure says that measuring and survey equipment (M&SE) must "display a calibration sticker indicating the calibrator, calibration date, and the calibration due date. If a calibration sticker is missing, apply one and transfer the required information from the calibration certificate." Calibration stickers on the M&SE were inconsistent. For example - Detector Model 19, Serial No. 182637, has two calibration stickers with different calibration due dates.

#### Unresolved Item 5

Referencing CT-QA-6.1, Section 7.5.2, Calibration, Repair and History Records do not exist for all M&SE. Specifically, Section 7.5.2 states "Document the following information about each item of M&SE on a Calibration, Repair and History Record ...". No Repair and History Record was prepared for Model 2360/43-89, Serial No. 1771888/188702, even though the equipment is currently out for repair.

#### Unresolved Item 6

Referencing CT-QA-7.1, Section 7 the Radiation Safety Audit Report for the audit conducted on July 1-3, 2002, does not contain audit finding forms, personnel contacted during the audit, and the auditors signatures. In addition, an audit notification letter was not prepared. Specifically, Section 7.3 requires that the QA Manager or designee, "Provide audit notification to the appropriate functional Manager." Section 7.7 requires that the auditor document any condition that does not meet a requirement on an Audit Finding Form. Section 7.10 requires that the auditor prepare a report which contains .."7.10.3 Personnel contacted during the audit" and "7.10.4 The auditors signature."

In addition, the report for the QA Readiness Audit conducted on May 28 - 30, 2002, has not been finalized.

During the inspection, the licensee committed to review and correct any deficiencies in the program as identified by the NRC and as identified in future licensee audits. The NRC will review the above items and the licensee's corrective actions, if any, during a future inspections and/or licensing actions.

### C. LICENSEE ACTIVITIES INSPECTED AFTER COMPLETION OF SITE REMEDIATION

#### Basis for Findings:

This section is not applicable.

### 3. INSPECTION OF STANDARD HEALTH AND SAFETY AREAS

## FROM THE OPERATIONAL INSPECTION PROGRAM

Identify the standard inspection areas (from the inspection program of the licensee's operational program) to be covered during each decommissioning inspection. [Inspection areas A through L below correspond to the typical inspection areas in the 87100 series IPs that are applicable to decommissioning.] Then identify the new activities within the standard inspection areas undertaken by the licensee during decommissioning. Some of the new activities given below, as well as any other activities the inspector identifies, should be considered inspection items under the general set of health and safety inspection areas used in the applicable 87100 series IP.

Minimum inspection areas for the initial decommissioning inspection: decommissioning organization (A.1); decommissioning activities in compliance with NRC-approved DP (A.2); licensee procedures for implementing the DP (A.3); Radiation Safety Committee (RSC) and Radiation Safety Officer (RSO) responsibilities (A.4); and the licensee's decommissioning training program (E.1).

### A. GENERAL OVERVIEW

1. Describe the licensee's decommissioning organizational structure:

The decommissioning organization is as described in the DP. Mark Puett is the licensee's Health & Safety Environmental Manager who has been designated as responsible for overall operations of the program. Tim Woodford is the radiation safety officer. At this time, the licensee has three separate contractors that are performing the decommissioning activities in accordance within Mallinckrodt's license.

2. Licensee is performing decommissioning activities in compliance with its approved DP. (X) Y ( ) N
3. Licensee has implemented procedures for the decommissioning activities identified in the DP. (X) Y ( ) N
4. The RSC and RSO fulfill license requirements to deal with all decommissioning activities. (X) Y ( ) N

### B. FACILITIES

1. Describe, from field observation, the licensee-identified facilities and outdoor areas to be decommissioned:

The licensee is implementing the Phase 1 portion of the DP. The NRC earlier in 2002 approved phase 1. During the inspection, the licensee was removing asbestos within radiologically restricted areas. The licensee plans to start demolishing buildings in the next few weeks.

In addition, the licensee is removing overhead, outdoor piping that was apart of the licensee's NRC activities. Since the contaminated piping are in the same pipe stands as active pipes currently being used to transport chemicals throughout the site, the licensee is being cautious not to damage active piping.

2. The licensee's remediation plan includes all the contaminated facilities and areas on-site and off-site. ( ) Y (X) N
3. All essential systems and services (e.g., electrical power, water supply, communications

systems) are in place and functional for the planned decommissioning activities. (X) Y ( ) N

4. Licensee's emergency plan is in place and operative for the duration of decommissioning. ( ) Y ( ) N

This area was not reviewed during this inspection.

5. For complex sites needing site characterization, describe the key site characterization activities to be performed by the licensee to determine the nature and extent of contamination:

The NRC discussed phase 1 characterization plans with the licensee. The licensee is currently developing the phase 2 program that will deal with surface and subsurface contamination.

6. Licensee's characterization activities performed in conformance with good industry practice. (X) Y ( ) N

#### C. EQUIPMENT AND INSTRUMENTATION

1. Survey instruments are applicable to contaminants of interest. (X) Y ( ) N
2. Use of survey instruments appropriate for site. ( ) Y (X) N

Basis for Findings:

The inspectors identified that an individual was not adequately trained to analyze results from a portable radiation survey instrument. See section E for details.

#### D. MATERIALS

1. Radioactive materials licensed during operations have been removed offsite; residual quantities conform to license conditions. (X) Y ( ) N
2. Security and control of licensed materials, including contaminated areas, is being maintained. (X) Y ( ) N

Basis for Findings:

During an inspection of a contractor in May 2002, a contractor for the licensee was removing and disposing the roofing material contaminated with radioactive material to an authorized disposal facility. No violations of NRC requirements were identified during that inspection.

#### E. TRAINING

1. Licensee has developed training program for new decommissioning activities (e.g., demolition of structures, excavation

- of soil); program is adequate. (X) Y ( ) N  
 2. Training program being effectively implemented. ( ) Y (X) N

Basis for Findings:

Referencing Section 5 of the approved DP, the licensee has not sufficiently documented RP training to support Mallinckrodt's claim that workers have been trained to the procedures supporting Tasks HP-13 and HP-14. Specifically, Section 5.6 of the DP states that, "Every step of the decommissioning process, from training personnel to calculating and interpreting the data, shall be documented in a way that lends itself to audit. Records of training to demonstrate qualification will also be maintained." However, there was no documentation to show that the JHPT and SHPT had been trained to procedures RP 38, RP 39, and RP 40 as required to perform Tasks HP -13 and HP-14.

Condition 18 of License No. STB-401 states that the Decommissioning of the C-T process buildings shall be done in accordance with the "Phase 1 Plan for C-T Decommissioning" submitted on January 10, 2002. Section 3.3 of the Phase 1 Plan for C-T Decommissioning states that the contractor will be required to implement the contamination control program with oversight by the Site RSO. Section 6.2 states of CT-RP-38 titled "Survey Requirements and Frequencies" states, in part, that the Radiation Protection, Health and Safety Manager ensures those persons performing surveys are appropriately trained.

As a result of the above finding, the inspector performed interviews with the individuals that documentation was not available regarding the RP training. During the interviews of one individual, the inspector identified that the individual did not understand how to properly interpret the results of radiological surveys using a survey instrument. Specifically, the technician could not accurately read and analyze the data from the survey instrument to ensure radiological contamination was not leaving restricted areas. The technician had no previous experience with radiation survey instruments but had received the training on CT-RP-38. CT-RP-38 deals with radiological surveys with a radiation survey instrument. The licensee acknowledged that the training was inadequate for this individual. The licensee pulled the technician from CT-RP-38 activities and committed to retrain the technician prior to him performing further radiological surveys. Between June 24, 2002 and July 16, 2002, the technician performed numerous radiological contamination surveys on individuals departing the radiologically restricted areas. Although training was provided to the technician, the technician was not appropriately trained because the technician did not understand how to properly use a radiation survey instrument to ensure compliance with CT-RP-38. This is a violation of NRC requirements.

In addition to the corrective actions concerning the technician, the licensee is reviewing all training concerning decommissioning activities and will address any lack of training in a similar manner. The NRC is satisfied with the licensee's corrective actions concerning this violation and to identify and corrective similar issues in the future. Therefore, the Notice of Violation will not require a response to the cited violation.

F. AREA RADIATION SURVEYS AND CONTAMINATION CONTROL

1. Area surveys are being performed in areas being decommissioned. (X) Y ( ) N  
 2. Where active remediation (e.g., demolition of structures, excavation of soil) is being performed, radiation levels in unrestricted areas do not exceed 2 mrem in any one hour. (X) Y ( ) N

Basis for Findings:

Although the licensee met the above conditions, the inspectors questioned the training of a technician performing contamination control. See section E for details.

#### G. RADIATION PROTECTION

1. The licensee's approved health physics program is being implemented in the field for new decommissioning activities. (X) Y ( ) N
2. Site security and control of contaminated material are in compliance with 10 CFR 20.1801 and 20.1802. (X) Y ( ) N

#### H. RADIOACTIVE WASTE MANAGEMENT/EFFLUENTS/ENVIRONMENTAL MONITORING

1. Offsite disposal of decommissioning wastes conforms to free release criteria and disposal site requirements. (X) Y ( ) N  
See Below

2. All new effluent releases conform to DP and applicable regulations. ( ) Y ( ) N

This area was not reviewed during this inspection.

3. The licensee's environmental monitoring program is being implemented in conformance with the DP and all applicable limits are being met. ( ) Y ( ) N

This area was not reviewed during this inspection.

4. Temporary storage/staging areas for radioactive wastes from building demolition, equipment dismantlement, soil excavation, etc., are adequately posted and protected. (X) Y ( ) N

#### Basis for Findings:

The licensee's solid radioactive waste program does not currently possess procedures to package, perform radiological surveys nor ship radioactive waste off site. The licensee is currently developing those procedures which will be fully developed and approved prior to implementation.

#### I. RECORDKEEPING FOR DECOMMISSIONING

1. Copies of the licensee's decommissioning cost estimates and funding methods are on file. ( ) Y ( ) N
2. Licensee has adequate records for decommissioning activities performed (e.g., for decontamination and dismantlement of structures; decontamination and remediation of soil, sediment, surface waters, groundwater; surveys of remediated facilities). ( ) Y ( ) N
3. Licensee's financial assurance conforms with the financial assurance requirements of NRC-approved possession limits and NRC regulations. ( ) Y ( ) N

Basis for Findings:

This section was not reviewed during this inspection.

#### J. TRANSPORTATION

1. Describe the licensee's program to package and ship decommissioning waste materials: See Below
  
2. Licensee's program meets all applicable 10 CFR and 49 CFR requirements for marking labeling, placarding, and shipping paper requirements for radioactive waste shipments. See Below

Basis for Findings:

The licensee is currently developing procedures to ensure proper waste transport and transfer. The NRC is currently reviewing the licensee's proposals to transfer radioactive waste to Envirocare which is located in Utah.

#### K. POSTING AND LABELING

1. All contaminated areas, waste processing areas, and waste handling areas are posted in conformance with regulations. (X) Y ( ) N
2. Packaged radioactive waste materials are labeled in accordance with regulations. (X) Y ( ) N

Basis for Findings:

While reviewing some of the licensee's health physics practices, the inspector noted that posting and labeling were properly addressed in the areas inspected.

#### L. OCCUPATIONAL HEALTH AND SAFETY

1. Describe the occupational health and safety observations made at the licensee's facilities:  
  
Safety shoes, glasses, helmets and other safety equipment were required in areas inspected. All personnel working in these areas were provided with the appropriate equipment.
  
2. Licensee and Occupational Safety and Health Administration were informed of occupational health and safety issues observed during the inspection. (X) Y ( ) N

#### 4. VIOLATIONS, NON-CITED VIOLATIONS, FOLLOWUP ITEMS, AND OTHER ISSUES

Briefly state (1) the requirements and (2) how and when the licensee violated the requirement. For non-cited violations, indicate why the violation was not cited. Briefly describe followup items and other issues.

During the inspection, 40 findings were identified (see section A.2 for details), six unresolved items were identified (see section 2.B for details) and one violation of NRC requirements was identified (see section 3.E for details). The NRC will review the findings and unresolved items during future inspections. The NRC has reviewed the licensee's corrective actions concerning the violation of NRC requirements and determined that no further licensee responses are necessary.

After the site inspection, the licensee provided the NRC with corrective actions on a selected number of findings, unresolved items and the violation. The licensee is continuing to review its program to ensure full compliance with NRC requirements. With the exception of the corrective actions concerning the violation, all other corrective actions will be reviewed during future inspections.

END