

March 24, 2003

Alan S. Hanson  
President and Chief Executive Officer  
Transnuclear, Inc.  
Four Skyline Drive  
Hawthorne, NY 10532-2176

SUBJECT: NUCLEAR REGULATORY COMMISSION (NRC) INSPECTION REPORT NO.  
72-1004, 72-1027/2003-201 AND NOTICE OF VIOLATION

Dear Mr. Hanson:

This refers to the inspection conducted on January 27 through February 7, 2003, at the facilities of Hitachi Zosen Diesel and Engineering Company, Ltd. (HZ D&E), in Ariake, and Kobe Steel Ltd. (KSL), in Takasago, Japan. HZ D&E and KSL are fabrication contractors for Transnuclear, Incorporated (TN), fabricating dry storage cask components for two TN spent nuclear fuel cask storage systems. The components being fabricated were for Exelon Corporation's Peach Bottom and Oyster Creek nuclear stations, Nuclear Management Corporation's Point Beach nuclear station, and Pennsylvania Power and Light's Susquehanna nuclear station. The inspection was conducted to determine if fabrication activities were performed in accordance with the requirements of 10 CFR Parts 21 and 72, the applicable Certificate of Compliance and Safety Analysis Report, and TN's NRC-approved quality assurance program. The enclosed report presents the results of this inspection.

Based on the results of this inspection, the NRC has determined that five Severity Level IV violations of NRC requirements occurred. One violation was identified that was common to both KSL and HZ D&E. Additionally, three violations were identified at KSL, and one violation was identified at HZ D&E. Four violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. The violations are being cited in the Notice because they were identified by the NRC.

One violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600. The NCV is described in the subject inspection report. If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Chief, Transportation and Storage Safety and Inspection Section, Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and 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/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,  
/RA/ original signed by /s/

Robert J. Lewis, Chief  
Transportation and Storage Safety and  
Inspection Section  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Docket Nos. 72-1004, 72-1027

Enclosures:

1. NRC Inspection Report No. 72-1004,72-1027/2003-201
2. Notice of Violation

A. Hanson

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Robert J. Lewis, Chief  
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Docket Nos. 72-1004, 72-1027

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|                      |                         |               |                 |              |
|----------------------|-------------------------|---------------|-----------------|--------------|
| <u>Distribution:</u> | Docket 72-1004, 72-1027 |               |                 |              |
| NRC f/c              | PUBLIC                  | NMSS r/f      | SFPO r/f        | TSIS Route   |
| EBrach, SFPO         | CLMiller, IMNS          | SMerchant, OE | DBroaddus, NMSS | NJensen, OGC |
| RBellamy, RI         | KLandis, RII            | CMiller, RIII | BSpitzberg, RIV | BBrown, OCFO |
| LCamper, SFPO        | JMonninger              | SO'Connor     |                 |              |

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|--------------|---------|---|-------------------|---|---------|--|-----|
| OFC:         | SFPO    | E | SFPO              | E | SFPO    |  |     |
| <b>NAME:</b> | PNarbut |   | EZiegler          |   | RLewis  |  |     |
| <b>DATE:</b> | 3/21/03 |   | <del>3/1/03</del> |   | 3/24/03 |  | / / |

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**U.S. NUCLEAR REGULATORY COMMISSION  
Office of Nuclear Material Safety and Safeguards  
Spent Fuel Project Office**

**Inspection Report**

Docket Nos: 72-1004, 72-1027

Report: 72-1004, 72-1027/2003-201

Certificate Holder: Transnuclear, Inc.  
Four Skyline Drive  
Hawthorne, NY 10532-2176

Fabricators: Kobe Steel, Ltd.  
3-1, 2-Chome  
Shinhamma, Arai-Cho  
Takasago-City 676-8670  
Japan

Hitachi Zosen Diesel and Engineering  
Ariake Facility  
Nagasu-Machi, Tamana-Gun  
Kumamoto, 869-0193  
Japan

Dates: January 27-31 and February 3-7, 2003

Inspection Team: Charles Miller, Deputy Director Licensing and Inspection Directorate,  
Spent Fuel Project Office (SFPO)  
Paul Narbut, Team Leader, SFPO  
Frank Jacobs, Inspector, SFPO  
James Pearson, Inspector, SFPO

Approved by: Robert J. Lewis, Chief  
Transportation and Storage Safety  
and Inspection Section  
Spent Fuel Project Office, NMSS

ENCLOSURE 1

## EXECUTIVE SUMMARY

Nuclear Regulatory Commission (NRC) Inspection Report 72-1004, 72-1027/2003-201

From January 27 to February 7, 2003, an inspection team from the Office of Nuclear Material Safety and Safeguards (NMSS) Spent Fuel Project Office (SFPO) performed an inspection of selected fabrication activities for spent fuel dry storage and transportation casks being manufactured in Japan for use in the United States (US).

The team inspected fabrication activities to determine if they were performed in accordance with the requirements of the Code of Federal Regulations (CFR) 10 CFR Parts 21 and 72, the applicable Certificate of Compliance (CoC) and Safety Analysis Report (SAR), and Transnuclear Incorporated's (TN's) NRC-approved quality assurance (QA) program.

The team examined the activities at two fabrication sites, Hitachi Zosen Diesel and Engineering Company, Ltd. (HZ D&E), in Ariake, and Kobe Steel Ltd.(KSL), in Takasago. The work at HZ D&E was being performed for both TN and NAC Incorporated (NAC), while the work at KSL was being performed for TN only. TN and NAC hold CoCs issued by the NRC for specific spent fuel cask designs. The TN work at HZ D&E was being done for Oyster Creek and Susquehanna. The TN work at KSL was being done for Peach Bottom and Point Beach. The team examined welding, nondestructive examinations, leak testing, material controls and QA controls. Additionally, the team examined the adequacy of fabrication oversight activities by the reactor licensees and the CoC holders. To gain efficiencies while at HZ D&E, the team examined both TN and NAC hardware fabrication, and drew conclusions from those observations that were applicable to TN and NAC in common, where such common conclusions were considered valid. Generally, common conclusions could be drawn about the common fabrication processes, material receipt and handling, inspections, nondestructive examinations, personnel qualifications, quality assurance, quality control, and testing.

The first week of inspection was completed on January 31, 2003, at KSL. The team found the quality of construction to be excellent and the TN and licensee oversight to be adequate. Although the team found the overall quality of work to be excellent, the team did identify some areas requiring corrective action as discussed in detail in this report and the Notice of Violation. The team identified three violations at KSL involving the failure to obtain TN approval of procedures prior to implementation (a Non-Cited Violation [NCV]), the lack of a record identifying the welder for a temporary attachment weld, and a violation with several examples of inadequate procedure control. Additionally, one violation was identified that was common to both KSL and HZ D&E involving the lack of a procedure and records for quality control surveillances.

The second week of inspection was completed on February 7, 2003, at the HZ D&E facility. The team again found the quality of construction to be excellent and the oversight to be adequate. Again, the team identified some areas requiring corrective action as described in this inspection report and the attached Notice of Violation. In addition to the violation common to KSL and HZ D&E, one additional violation was identified at HZ D&E dealing with the lack of an up-to-date certification for a liquid penetrant examiner. The team also identified one poor

practice regarding the examination used for the qualification of lead auditors. The examination had 30 questions which were the same from examination to examination, and were available for new examinees to review. HZ D&E took immediate corrective action during inspection.

At both facilities, the team found that their ability to inspect was not significantly hampered by the language differences. The CoC holders had, for their own purposes, required that procedures and fabrication records in the Japanese language also be translated into the English language. The Japanese engineers and QA inspectors were generally functional in English as it applied to the fabrication processes. The fabricators were also very familiar with the applicable US Codes and standards. The team found the fabricators' QA organizations' problem identification and resolution practices to be comparable to those in the US.

The violations are summarized in Table 1 below.

Table 1  
Summary of Inspection Findings

| Regulatory Requirement<br>10 CFR Section | Subject    | Number of Findings | Type of Finding                                | Report Section |
|--|------------|--------------------|--|----------------|
| 72.174                                   | Records    | 2                  | Violation<br>72-1004/03-201-01                 | 2.3.2          |
|  |            |                    | Violation<br>72-1027/03-201-02                 | 2.6.2          |
| 72.150                                   | Procedures | 3                  | Violation<br>72-1027/03-201-03<br>(7 examples) | 2.6.2          |
|  |            |                    | Non-Cited Violation<br>72-1027/03-201-04       | 2.8.2          |
|  |            |                    | Violation<br>72-1004/03-201-05                 | 2.8.2          |

**INSPECTION PROCEDURES USED**

60852, "ISFSI Component Fabrication by Outside Fabricators"  
NUREG/CR 6314, "Quality Assurance Inspections for Shipping and Storage Containers"

**PERSONS CONTACTED**

The team held an entrance meeting with TN and KSL on January 27, 2003, to present the scope and objectives of the NRC inspection. Utility representatives from Nuclear Management Corporation (NMC), Point Beach, and Exelon, Peach Bottom, also attended the entrance meeting. On January 31, 2003, the team held an exit meeting with TN, KSL and the utility representatives to present the preliminary results of the inspection at KSL.

On February 3, 2003, the team held an entrance meeting with TN, NAC, and HZ D&E to present the scope and objectives of the NRC inspection. Utility representatives from Duke Power (McGuire) and Exelon (Oyster Creek and Susquehanna) also attended the entrance meeting. On February 7, 2003, the team held an exit meeting with TN, NAC, HZ D&E, and the utility representatives to present the preliminary results of the inspection at HZ D&E.

The individuals present at the entrance and exit meetings, and some other key personnel contacted, are listed below in Table 2.

Table 2  
Entrance and Exit Meetings Attendance

Kobe Steel Ltd.

| NAME              | TITLE  | AFFILIATION | ENTRANCE | EXIT |
|-------------------|--|-------------|----------|------|
| Charles Miller    | Deputy Director, Licensing and Inspection, Spent Fuel Project Office | NRC         | X        | X    |
| Paul Narbut       | Team Leader, SFPO  | NRC         | X        | X    |
| Frank Jacobs      | Inspector, SFPO  | NRC         | X        | X    |
| James Pearson     | Inspector, SFPO  | NRC         | X        | X    |
| John Cioffi       | Project Engineer   | TN          | X        | X    |
| Allen Hansen      | President and CEO  | TN          |          | X    |
| Daniel Hayes      | Oversight Representative   | TN          | X        | X    |
| Earl Love         | Supervisor, Vendor Surveillance                                      | TN          | X        | X    |
| Michael McDonald  | Project Engineer   | TN          | X        | X    |
| Koichi Akasaka    | Manager Manufacturing  | KSL         | X        | X    |
| Yoshiya Akishita  | Manufacturing Engineer   | KSL         |          |      |
| Hiroki Azukizawa  | Manager QA Section   | KSL         | X        | X    |
| Yoshio Enomoto    | QA Manager   | KSL         | X        | X    |
| Kenji Hosoda      | QA Engineer  | KSL         | X        | X    |
| Shinya Iwagami    | General Plant Manager  | KSL         | X        | X    |
| Kazuhiro Nakamura | Manager Engineering Section  | KSL         | X        | X    |
| Toshihiro Narai   | QA Engineer  | KSL         | X        | X    |
| Yoshiko Otani     | QA Section   | KSL         |          |      |
| Masayuki Nodaka   | Manufacturing Manager  | KSL         | X        | X    |

|               |                          |                 |   |   |
|---------------|--------------------------|-----------------|---|---|
| Masato Yamada | Project Manager TN-68    | KSL             | X | X |
| Russ Bastyr   | Supplier Quality Manager | Exelon          |   | X |
| Leo Ganser    | QA Manager               | NMC             | X |   |
| James Gill    | Senior QA Engineer       | NMC             | X | X |
| S. Kiyotomo   | Licensee Representative  | Qualitech Corp. |   |   |

## Hitachi Zosen Diesel and Engineering Ltd.

| NAME               | TITLE  | AFFILIATION | ENTRANCE | EXIT |
|--------------------|--|-------------|----------|------|
| Charles Miller     | Deputy Director, Licensing and Inspection, Spent Fuel Project Office | NRC         | X        | X    |
| Paul Narbut        | Team Leader, SFPO  | NRC         | X        | X    |
| Frank Jacobs       | Inspector, SFPO  | NRC         | X        | X    |
| James Pearson      | Inspector, SFPO  | NRC         | X        | X    |
| Roy Bass           | QA Manager   | NAC         | X        | X    |
| John McCarthy      | Fabrication Manager  | NAC         |          | X    |
| Larry Reaves       | Fabrication Representative   | NAC         | X        | X    |
| Howard Smith       | VP Quality   | NAC         | X        | X    |
| James White        | QA Representative  | NAC         | X        | X    |
| Richard Boyle      | Project Manager  | Framatome   |          |      |
| Daniel Hayes       | Oversight Representative   | TN          | X        | X    |
| Earl Love          | Supervisor, Vendor Surveillance                                      | TN          | X        | X    |
| William Bracey     | Project Engineer   | TN          | X        | X    |
| Takeshi Aboshi     | Manager, Cask Engineering Section                                    | HZ D&E      | X        | X    |
| Ryoji Asano        | Machinery Business Development Manager                               | HZ Corp.    | X        |      |
| Toshitsugu Iwamoto | QA Section   | HZ D&E      | X        | X    |
| Takashi Kawahara   | Cask Engineering Section   | HZ D&E      | X        | X    |
| Takeo Koike        | President  | HZ D&E      | X        |      |
| Yoshikazu Miyaji   | Manager of Energy and Nuclear Business Department                    | HZ Corp     |          |      |

|                     |                          |            |   |   |
|---------------------|--------------------------|------------|---|---|
| Masaki Mikata       | Manager, Nuclear Dept.   | HZ D&E     | X | X |
| Yoshinobu Morimoto  | Cask Engineering Section | HZ D&E     | X | X |
| Kenji Oguchi        | Manager, QA Section      | HZ D&E     | X | X |
| Toshitaka Yamaguchi | QA Section               | HZ D&E     | X | X |
| Masakatsu Yamashita | Manager, QA Department   | HZ D&E     | X | X |
| Russ Bastyr         | Supplier Quality Manager | Exelon     | X | X |
| Loren Ernst         | Sr. Technical Specialist | Duke Power | X | X |
| David Jones         | Spent Fuel Prog. Mgr.    | Duke Power | X | X |

### LIST OF ACRONYMS USED

|          |  |
|----------|--|
| ASME     | American Society of Mechanical Engineers         |
| ASTM     | American Society for Testing and Materials       |
| CAD      | Corrective Action Directive                      |
| CFR      | Code of Federal Regulations                      |
| CMTR     | Certified Material Test Report                   |
| CoC      | Certificate of Compliance                        |
| HZ Corp. | Hitachi Zosen Corporation                        |
| HZ D&E   | Hitachi Zosen Diesel and Engineering Ltd.        |
| ISFSI    | Independent spent fuel storage installation      |
| KSL      | Kobe Steel Ltd.                                  |
| M&TE     | Measuring and test equipment                     |
| mm       | millimeter                                       |
| MT       | Magnetic particle examination                    |
| NAC      | NAC International, Incorporated                  |
| NCV      | Non-Cited Violation                              |
| NDE      | Nondestructive examination                       |
| NMSS     | Office of Nuclear Material Safety and Safeguards |
| NMC      | Nuclear Management Corporation                   |
| NRC      | U.S. Nuclear Regulatory Commission               |
| NTI      | Nichizo Technical Incorporated                   |
| PT       | Liquid penetrant examination                     |
| QA       | Quality Assurance                                |
| SAR      | Safety Analysis Report                           |
| SFPO     | Spent Fuel Project Office                        |
| TN       | Transnuclear, Inc.                               |
| US       | United States of America                         |

## REPORT DETAILS

### 1. Inspection Scope

The inspection team inspected selected fabrication activities for spent fuel dry storage and transportation casks being manufactured in Japan for use in the United States. The inspection verified, through sampling, that spent fuel storage and transportation cask fabrication was being performed in accordance with the CoCs, the NRC-approved CoC holders' QA programs, and NRC regulations, and that the casks should be capable of performing their intended safety functions.

The team examined the activities at two fabrication sites, HZ D&E in Ariake, and KSL, in Takasago. The work at HZ D&E was being performed for both TN and for NAC, while the work at KSL was being performed for TN only. TN and NAC hold CoCs issued by the NRC for specific spent fuel cask designs. The TN work at HZ D&E was being done for Oyster Creek and Susquehanna, while the NAC work was being done for McGuire. The TN work at KSL was being done for Peach Bottom and Point Beach. The team examined welding, nondestructive examinations, leak testing, material controls and QA controls. Additionally, the team examined the adequacy of fabrication oversight activities by the reactor licensees and the CoC holders. The inspection was performed using NRC inspection procedures.

To gain efficiencies while at HZ D&E, the team examined both TN and NAC hardware fabrication, and drew conclusions from those observations that were applicable to TN and NAC in common, where such common conclusions were considered valid. Generally, common conclusions could be drawn about the common fabrication processes, material receipt and handling, inspections, nondestructive examinations, personnel qualifications, quality assurance, quality control, and testing.

### 2. Fabrication Controls

#### 2.1 Fabrication Specifications

##### 2.1.1 Scope

The team examined a sample of fabrication specifications to determine if the specifications were consistent with the design commitments and requirements documented in the SAR and the CoC.

##### 2.1.2 Observations and Findings

The team did not identify any problem areas or discrepancies between the fabrication specifications and the SAR and CoC.

### 2.1.3 Conclusions

Based on the documents reviewed, the team concluded that fabrication specifications were consistent with the SAR and CoC at both facilities.

## 2.2 Corrective actions

### 2.2.1 Scope

The team examined the procedures for identifying problems and nonconformances, and for implementing corrective actions. Additionally, the team sampled nonconformance and corrective action documents which had been identified during the fabrication process and verified that the actions taken were appropriate.

### 2.2.2 Observations and Findings

The team considered the sampled procedures, nonconformances, and corrective actions to be adequate. Corrective actions were appropriate in scope and timeliness and commensurate with the problems identified.

### 2.2.3 Conclusions

The team concluded that problems, deficiencies and nonconformances were being identified, documented, and effectively resolved at both facilities.

## 2.3 Training and Certification

### 2.3.1 Scope

The team reviewed applicable procedures and records to determine if individuals performing quality-related activities were trained and certified where required. The team sampled training and qualification records for quality assurance, quality control, welding, nondestructive examination (NDE), and leak and pressure testing personnel.

### 2.3.2 Observations and Findings

The team found that, overall, the procedures, training, and qualification records met the required codes and standards and that personnel were properly trained and qualified.

However, the team identified a problem regarding the retention and currency of personnel qualification records for an NDE examiner. HZ D&E procedure, M-50-1, "Examination, Inspection and Test," Revision 3, Step 3.2(2) requires that HZ D&E retain copies of examiner certification and qualification records. The team noted that neither HZ D&E nor Nichizo Technical Incorporated (NTI), a supplier of NDE personnel to HZ D&E, had up-to-date records for the certification of an NTI employee performing liquid penetrant examinations. Additionally, HZ D&E and NTI had differing versions of outdated records for the individual. 10 CFR 72.174, "Quality assurance records," requires that records of qualification of personnel be maintained.

The failure to maintain up-to-date records of personnel qualifications is considered a violation of 10 CFR 72.174.

(Violation 72-1004/03-201-01)

HZ D&E personnel wrote a deficiency report, took immediate corrective action and updated the personnel qualification records during the inspection.

Additionally, the team examined Quality Assurance Lead Auditor and Auditor qualifications at HZ D&E, and reviewed Document Q-01-3, "Audit Personnel Qualification Standard," Revision 1. No discrepancies were noted with the records and qualifications of the auditors. However, the team noted that Document Q-01-3, paragraph 4.2(5), required that, in order to qualify, a prospective lead auditor answer 30 questions and obtain a passing grade of 80% or greater. The team observed that two examinations taken September 7, 2002, had essentially the same questions as one taken April 24, 2000. Also, two examinations taken April 6, 1999, and September 30, 1998, were identical. However, the team noted that, due to the stability of the workforce, only a small and infrequent number of lead auditor examinations had been given. Therefore, the team considered the reuse of examination questions to be acceptable if access to the questions and answers was controlled. However, the team noted that the lead auditor qualification records were filed in an accessible area such that a prospective lead auditor could have access to the questions and answers prior to taking the qualification examination. The team considered the availability of the examinations to be a poor practice and a weakness in the quality assurance program. The HZ D&E QA manager agreed and on February 5, 2003, removed all examinations from the qualification files for lead auditors, inspectors, and test personnel, and established a separate file controlled by the QA Manager. A statement of examination grade, date, and control of the actual examination was placed in each individual's qualification file. The team considered the corrective action to be adequate.

### 2.3.3 Conclusions

The team concluded that overall, the qualification and certification of personnel was generally adequate and well controlled at both facilities. One violation was identified at HZ D&E for the lack of an up-to-date certification record and one weakness was identified regarding the lack of confidentiality of lead auditor examination questions.

## 2.4 Fabricator Personnel Knowledge

### 2.4.1 Scope

The team observed fabrication, NDE, and quality control work in progress, reviewed records, and interviewed personnel to assess the fabricators' personnel's familiarity with the specified design, designated fabrication techniques, testing requirements, and quality controls associated with the construction of the spent fuel dry storage casks.

### 2.4.2 Observations and Findings

The team found the overall quality of fabrication and the knowledge and skill levels of the inspection, craft and NDE personnel to be excellent at both facilities.

### 2.4.3 Conclusions

At both facilities, the team concluded that the fabricators' personnel were adequately familiar with the specified design, designated fabrication techniques, testing requirements, and quality controls associated with the construction of the spent fuel dry storage casks.

## 2.5 Material and Procurement Specifications

### 2.5.1 Scope

The team sampled materials to determine if they met the design requirements and procurement specifications. Additionally, the team sampled procurement specifications to verify the specifications conformed to the requirements contained in the SAR and the CoC.

### 2.5.2 Observations and Findings

At KSL, the team examined KSL's approved vendor list, document GI-0578, Revision 3, which is specific to the TN-68 cask. GI-0578 listed the cask component items and identified the approved vendors for each item. The team found that the material vendors for sampled TN-68 items in fabrication were consistent with GI-0578. The team also found that the purchasing specification for the materials conformed to the requirements in the SAR and CoC. Sampled Certified Material Test Reports (CMTRs) indicated the selected material met the requirements of the purchasing specification.

At HZ D&E, the team examined two procurements for cask materials at HZ D&E that were not for TN work, but allowed assessment of HZ D&E material procurement activities for both TN and NAC. The material specification, purchase order, approved vendor list, CMTR, and the receiving inspection record sheet for a procurement of American Society for Testing and Materials (ASTM) A240 Type 304 stainless steel plate were all consistent and indicated the material met design requirements.

For a procurement of neutron absorber plates, the team identified a violation for inadequate procedure applicable only to the other CoC holder, not TN, since the procedure was not applicable to, nor approved by TN. The violation is described in NRC inspection report 72-1015/2003-201.

### 2.5.3 Conclusions

At both facilities, the team concluded that the sampled material and procurement specifications conformed to the requirements contained in the SAR and CoC.

## 2.6 Fabrication

### 2.6.1 Scope

The team observed fabrication, inspection, testing and nondestructive examination in progress, and examined selected specifications, procedures, and records to determine if

components were being fabricated in accordance with procedures, specifications, drawings, and NRC requirements.

### 2.6.2 Observations and Findings

Overall the team found the quality of fabrication at both facilities to be excellent. The team verified that the fabricators' personnel used current procedures, and performed appropriate nondestructive testing and dimensional checks. The team also verified that measuring and test equipment (M&TE) was calibrated according to recognized standards. However, the team identified some problems and violations described below:

#### *Temporary Attachment Welds*

At KSL, the team noted that there was no permanent record of the welder of some temporary attachment welds to a cannister shell. The CoC requires that the cask be manufactured in accordance with the American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code. The temporary attachment welds were clips attaching temporary stiffening rings to the cask shell inner diameter, a confinement boundary. The welds in question were welds JX-1001 for cannister TN-68-21. ASME, Sections NB 4321, 4322.1, and 4435 require that temporary attachment welds be made by qualified welders and that records of the joints welded be maintained. 10 CFR 72.174, "Quality assurance records," requires that records pertaining to the fabrication be maintained. The failure to maintain a record of the welder of a temporary attachment weld is considered a violation of 10CFR 72.174.

(Violation 72-72-1027/03-201-02)

The team initially noted that apparently there were no records of a magnetic particle examination (MT) of the base metal after the removal of the temporary attachment. ASME NB 4435 requires a surface NDE examination such as MT after the removal of a temporary attachment weld. After research, the fabricator and the CoC holder noted that subsequent to the removal of the temporary attachment weld the cannister shell inner diameter was machined and a metal thickness of about 3/16 inch was removed from the temporary attachment areas. The fabricator determined that, after this metal removal, the temporary attachment area did, in fact, receive an MT. Consequently, there was no violation of code requirements for failure to perform an MT. However, the team considered that the procedure controlling the temporary attachment (Process Checklist TN-68-18, Item A340-B) had inadequate controls in that it did not provide a procedure link from the traveler that controlled the installation and removal of the temporary attachment, to the traveler that performed the MT.

10 CFR 72.150, "Instructions, procedures, and drawings" requires that procedures include appropriate acceptance criteria for determining that activities had been satisfactorily accomplished. The failure to include or reference a companion record for the performance of MT after the removal of the temporary attachment weld to the shell of cannister TN 68-21, is considered a violation of 10 CFR 72.150 for inadequate procedure controls.

(Violation 72-1027/03-201-03, Example 1)

The fabricator, KSL, wrote a corrective action directive (CAD-TNY-0316 dated January 31, 2003) to acknowledge the problem and to specify corrective action.

The team observed that the KSL procedure GZ-6633, Revision 5, "Weld Repair Procedure for TN68 Dry Storage Cask," contained an error which allowed accepting grind outs of greater than 1/16 inch without weld repair, whereas the procedure was intended to state that grind outs less than 1/16 inch were acceptable without weld repairs. The erroneous instruction was considered a violation of 10 CFR 72.150, "Instructions, procedures, and drawings," for inadequate procedure controls.

(Violation 72-1027/03-201-03, Example 2)

The team examined a sample of grind outs on cask hardware in the facility and found that there were no grind out areas greater than 1/16 inch, indicating that the grind out limitation was properly implemented.

#### *Hydrostatic Test Procedure*

The team examined KSL's cask hydrostatic test procedure (44M-1396, Revision 3) and an associated test report (T-A370) for cask TN-68-16. Additionally, the team examined the hydrostatic test procedure (44M-1480, Revision 0, "Hydrostatic Test Procedure for Port Covers") and its associated test report (HT-LV090 dated September 27, 2002). The test procedures were in accordance with the applicable ASME code and the procedures were approved by TN. Procedure 44M-1480 paragraph 8, required that the hydrostatic testing be witnessed by TN and Exelon. However, the test report HT-LV090 did not have witness signatures for the tests performed, and the signature block was lined through without any explanation. This failure to witness the hydrostatic test as required by the approved test procedure is a violation of 10 CFR 72.150, "Instructions, procedures, and drawings," which requires that the certificate holder shall prescribe activities affecting quality by documented procedures and shall require that these procedures be followed.

(Violation 72-1027/03-201-03, Example 3)

KSL issued corrective action directive CAD-TNY-0315 on January 30, 2003, to initiate corrective action. The team considered the proposed immediate corrective action to be adequate.

#### *Helium Leak Testing*

The team examined the KSL helium leak test procedure (MSLT-1, Revision 2) and test data sheet (HL-A560-1) for the containment boundary for cask TN-68-16. The test procedure had been approved by TN. On page 8 of 14 of HL-A560-1 for the test conducted October 9 and 10, 2002, a white-out correction had been made to entered data. However, paragraph 9.5 of KSL's document 44S-2136, "Quality Plan for TN-68 Casks," Revision 4, dated June 7, 2002, prohibits the use of white-out to change records. This failure to comply with the requirements of the approved procedure prohibiting the use of white-out is a violation of 10 CFR 72.150, "Instructions, procedures, and drawings," which requires that the certificate holder shall prescribe activities affecting quality by documented procedures and shall require that these procedures be followed.

(Violation 72-1027/03-201-03, Example 4)

KSL issued corrective action directive CAD-TNY-0317 on January 30, 2003, to initiate corrective action. The team considered the proposed corrective action to be adequate.

#### *Neutron Shield Pouring*

The team examined KSL's documents GZ-6681, "Resin Pouring Procedure and Personnel Qualification Test Specification," and GZ-6630, "Polyester Resin Installation Procedure." Both procedures had been approved by TN. GZ-6630, Revision 1, paragraph 5.16, stated that the maximum concavity of the final resin pouring surface was 3 millimeters (mm), and paragraph 7 required that visual examination of the final surface be recorded. The team noted that the resin pouring checklist used to record data from the pour did not include items for the concavity measurement or visual inspection. KSL personnel initially stated that inspection of those attributes was to be recorded on a different record, report number DT-A461-IR, "Dimensional Report." However, the team reviewed report number DT-A461-1R, for cask TN-68-18, and found that it involved a different general inspection, procedure GI-0580, "Dimensional Check Procedure," and did not include the 3 mm maximum concavity requirement for the resin. The failure to provide data sheets with appropriate acceptance criteria is a violation of 10 CFR 72.150, "Instructions, procedures, and drawings," which requires that the certificate holder shall prescribe activities affecting quality by documented procedures appropriate to the circumstances and include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. (Violation 72-1027/03-201-03, Example 5)

The team examined TN Procedure 96-T-001, "Reactivity Test for Shielding Component," Revision 3. The procedure required that, when the accelerator component of the shielding mixture had reached the manufacturer's recommended shelf life limits, a reactivity test be performed monthly to verify the adequacy of the mixture for resin pouring. KSL's entire stock of accelerator had a manufacturer's shelf life expiration date of August 21, 2001, and therefore required a monthly reactivity test to be used after that date. The team observed the resin pouring checklist for cask TN-68-16 that recorded a mixing on January 31, 2002, for shielding pours, pipes 291 to 294 and 471 to 473. However, the team noted that the last reactivity test prior to that pouring was reactivity test number RT1201-2 dated December 26, 2001, several days in excess of the monthly limit. The team noted at least ten other shield pours that were performed based on a reactivity test that was more than one month old. This failure to comply with the requirements of the approved procedure requiring a monthly reactivity test is a violation of 10 CFR 72.150, "Instructions, procedures, and drawings," which requires that the certificate holder shall prescribe activities affecting quality by documented procedures and shall require that these procedures be followed. (Violation 72-1027/03-201-03, Example 6)

KSL performed a reactivity test during the inspection on January 31, 2002, and demonstrated the adequacy of the shielding pours that had been performed.

#### *Shelf Life of Liquid Penetrant Materials*

The team noted that some KSL procedures and quality plans did not require a determination as to the acceptable shelf life of materials prior to use while other procedures did. As an

example, KSL procedure CEP-NQA-28, Quality Assurance Program Plan for NUHOMS-32PT Dry Shielded Canister, Revision 4, section 7.0, step 7, requires a certificate to be supplied by the manufacturer with purchasing specification documents, indicating the date(s) or shelf life of procured items. However, the team observed an examiner performing a liquid penetrant test (PT) using procedure GI-0611, Revision 2, "NDE Procedure for NUHOMS 32 Dry Shielded Canister," and noted that the procedure did not require verification that the shelf life of the PT materials had not expired. Similarly, the team also noted that procedure 44M-1412, Revision 0, "Painting Procedure (for TN-68 casks)," did not require the verification of the shelf life of coating materials prior to the use. In TN audit report V-02-03, performed June 10-13, 2003, TN had identified that there was a lack of procedure controls for verifying shelf life of materials. The audit finding had been closed as of January 6, 2003, by TN based on the addition of shelf life requirements in Revision 3 of CEP-NQA-28, on October 18, 2002. However, the team noted that verification of the shelf life currency of the materials was not carried down to the KSL working level documents such as the aforementioned PT and painting procedures.

The failure to provide implementing procedures to verify the adequacy of materials with shelf life requirements is considered a violation of 10 CFR 72.150, "Instructions, procedures, and drawings," for inadequate procedure controls.  
(Violation 72-1027/03-201-03, Example 7)

During the inspection, the team did not find materials where shelf life had expired.

### 2.6.3 Conclusions

At both facilities, the team concluded that overall, fabrication, inspection, testing and nondestructive examination were performed adequately and were in accordance with procedures, specifications, drawings, and NRC requirements. However, violations were identified at KSL for inadequate procedure controls and records. The violations did not affect the quality of the hardware and no rework was required. Overall, the quality of the fabrication at both facilities was excellent.

## 2.7 Part 21 Implementation

### 2.7.1 Scope

The team examined the fabricators' implementing procedures, observed postings of 10 CFR Part 21 requirements at the fabrication facilities, and interviewed fabrication personnel.

### 2.7.2 Observations and Findings

The team found the fabricators' procedures and postings of 10 CFR Part 21 requirements met requirements. The team noted that the postings were in English and Japanese.

### 2.7.3 Conclusion

The team concluded that the fabricators had adequately implemented 10 CFR Part 21 requirements at both facilities.

## 2.8 Audits and Oversight

### 2.8.1 Scope

The team examined selected audits and surveillances to determine if KSL and HZ D&E had been audited by TN and the licensees and to determine if corrective actions had been implemented in a time frame commensurate with their safety significance.

### 2.8.2 Observations and Findings

#### *Audits*

The team examined recent TN audits of KSL. TN audited KSL in May 2001 (TN Audit V-01-04) with Exelon participating, and in June 2002 (TN Audit V-02-03) with NMC participating. All findings appeared to be appropriately handled in a time frame commensurate with their safety significance. TN also performed a surveillance (Surveillance Report S-03-01) on January 10, 2003. This surveillance identified 4 findings and 5 observations which detailed instances of KSL performing activities affecting quality prior to receiving TN approval. For example, KSL used Procedure NDE-309, Revision 4, during TN-68 fabrication prior to TN approval. Similarly, KSL implemented Revision 11 of its QA Manual, CEP-ISO-1, prior to TN approval. Additionally, KSL salvaged the outer shell from a scrapped cask assembly using an instruction that had not been approved by TN, and also performed repairs to the outer shell without a TN approved instruction. The TN surveillance report noted that TN's procedure, "Procurement Specification for the TN-68 Spent Fuel Storage Cask," E-18597, required that all procedures prepared by the fabricator be forwarded to TN for review and approval prior to initiation of the activities described in the procedure. Likewise, the KSL procedure CEP-NQA-27, Revision 5, "Quality Assurance Program Plan for TN-68 Casks," required KSL to submit all procedures to TN for approval before starting fabrication activities. The team considered the failures to obtain TN approval of implementing procedures to be a violation of 10 CFR 72.150, "Instructions, procedures, and drawings." This non-repetitive, certificate holder-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VI.A.8 of the NRC Enforcement Policy.

(Violation 72-1027/03-201-04)

The team also reviewed the TN audit of HZ D&E in November 2002 (TN Audit V-02-07). The report identified six findings and nine observations. Finding V-02-07-06 documented closure by HZ D&E of Nonconformance Reports without adequate verification of TN approval. This was similar to a TN surveillance finding at KSL. HZ D&E provided responses to the audit findings (Doc. No. 03-TN-0115) in January 2003, but the responses had not been evaluated by TN at the time of the inspection.

At KSL, the team noted that the general manager was also in charge of the divisions of procurement and production control. The QA manager reports to the general manager but is also responsible to audit and assure quality in the divisions of procurement and production control. The team questioned the ability of the QA organization to perform the quality assurance functions in the divisions of procurement and production control with sufficient independence. The QA manager demonstrated that QA was performing audits of the divisions of procurement and production control, identifying problems and ensuring corrective actions were taken. The team concluded from the objective evidence that QA had sufficient independence at KSL.

### *Surveillances*

The team noted that neither KSL nor HZ D&E had procedures in place describing its program for QC or QA surveillances or work monitoring. At HZ D&E, QA management stated that they performed regular surveillances and kept records for five years. At KSL, QA management stated that they performed regular surveillances, but did not maintain records of the surveillances. Surveillances were not required by the fabricators' QA programs but had been performed as a good practice but without the necessary procedural guidance to ensure proper planning, consistency and management review of the activities surveilled. The team noted that 10 CFR 72.150 requires that activities affecting quality be prescribed by documented procedures. In addition, 10 CFR 72.174 requires that sufficient records be maintained to furnish evidence of activities affecting quality, and that the records must include monitoring of work performance. The team considered the lack of procedures and records for the performance of QA surveillances to be a violation of 10 CFR 72.150 and 10 CFR 72.174 (Violation 72-1004/03-201-05)

### *Oversight*

The team examined the oversight of fabrication at KSL and HZ D&E provided by TN, the CoC holder, and by the licensees. The team noted that TN had two individuals in Japan working alternately to provide significant, near continual, activity coverage. One individual was in country while the other returned to the US. The individual in Japan split his time between the two fabrication facilities, dependent on activities in progress. TN had also contracted with a Japanese national to represent them as well. The team interviewed two of the individuals and their supervisor and determined that all individuals were well qualified for fabrication oversight by knowledge and experience. The individuals worked to approved oversight procedures and were responsible to perform the verifications for the many witness and hold points in the fabrication travelers. They were responsible for ensuring the fabricators initiated nonconformance reports when problems were encountered. They performed triennial audits of the fabricators. The team noted that their supervisor was frequently in Japan performing oversight of their activities.

The team also interviewed the licensee representatives present at the fabrication facilities. The licensees used and shared a Japanese national as their representative for hold and witness points. The individual was knowledgeable and had a well established background. The licensees did not have full time US representatives, but demonstrated a regular presence through multiple visits per year.

### 2.8.3 Conclusions

The team concluded that TN and the licensees performed adequate audits and surveillances of KSL and HZ D&E, and that corrective actions were implemented in a timely manner. A TN identified non-cited violation was identified regarding failure of KSL to obtain TN approval for procedures for activities affecting quality as required by its QA plan. A violation was identified for a lack of procedures and records for the performance of QA surveillances. The team found that oversight of fabrication activities by TN and the licensees was extensive and adequate.

### **3. Exit Meeting**

On January 31, 2003, after the first week of inspection at KSL, the team had an exit meeting with TN and representatives of KSL. Utility representatives from Nuclear Management Corporation (Point Beach) and Exelon (Peach Bottom) also attended the exit. The results of the inspection to that point were discussed.

On February 7, 2003, after the second week of inspection, the team had a combined exit meeting with TN, NAC, and HZ D&E representatives. Utility representatives from Duke Power (McGuire) and Exelon (Oyster Creek and Susquehanna) also attended the exit. The CoC holders, TN and NAC, had previously agreed to a combined exit meeting and stated that they were not uncomfortable with the combined exit. Although exit meetings are usually held with a single CoC holder, the circumstances made a single meeting much more efficient. The results of the inspection were discussed.

## NOTICE OF VIOLATION

Transnuclear, Incorporated  
Hawthorne, New York

Docket Nos. 72-1004, 72-1027

During an NRC inspection conducted at the fabrication facilities of Kobe Steel Ltd. (KSL), in Takasago, Japan on January 27-31, 2003, and Hitachi Zosen Diesel and Engineering Company, Ltd. (HZ D&E), in Ariake, Japan, on February 3-7, 2003, violations of NRC requirements were identified. KSL and HZ D&E are spent fuel storage cask fabricators for Transnuclear Incorporated (TN). In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violations are listed below:

- A. 10 CFR 72.174, "Quality assurance records," requires, in part, that records be maintained to furnish evidence of activities affecting quality and that the records must include qualifications of personnel.

HZ D&E procedure, "Examination, Inspection, and Test," Step 3.2, requires HZ D&E maintain personnel certification and qualification records.

Contrary to the above, on February 4, 2003, the current liquid penetrant examination (PT) certification for a PT examiner was not available in the HZ D&E personnel certification files.

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

- B. 10 CFR 72.150, "Instructions, procedures, and drawings," requires, in part, that the certificate holder shall prescribe activities affecting quality by documented procedures, appropriate to the circumstances, and that these procedures be followed.
1. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code (ASME) section NB 4435 requires a surface examination such as magnetic particle examination (MT) after the removal of a temporary attachment weld. NB 4121.1 requires that reports of examinations be available.

KSL process checklist TN-68-18, Item A340-B is the procedure controlling temporary attachment welds for attaching temporary stiffening rings to the spent fuel storage cask shell inner diameter.

Contrary to the above, checklist TN-68-18, Item A340-B was not appropriate to the circumstances in that it did not provide a record of the MT performed for welds numbered JX-1001 to canister TN-68-21, nor did it provide a reference to the checklist that recorded the MT.

ENCLOSURE 2

2. KSL procedure GZ-6633, Revision 5, "Weld Repair Procedure for TN68 Dry Storage Cask," is the procedure which controls the acceptance or repair of surface defects.

Contrary to the above, procedure GZ-6633 was not appropriate to the circumstances in that it allowed accepting grind outs of greater than 1/16 inch without weld repair, whereas the procedure should have stated that grind outs less than 1/16 inch were acceptable without weld repairs.

3. KSL procedure 44M-1480, Revision 0, "Hydrostatic Test Procedure for Port Covers," paragraph 8, requires that the hydrostatic testing be witnessed by TN and Exelon.

Contrary to the above, Hydrostatic Test Report No. HT-LV090 for the TN-68-16 drain and vent port covers did not have witness signatures for the tests performed September 27, 2002, and the signature block was lined through.

4. KSL procedure 44S-2136, "Quality Plan for TN-68 Casks," Revision 4, dated June 7, 2002, paragraph 9.5, prohibits the use of white-out to change records.

Contrary to the above, a white-out correction had been made to entered data on page 8/14 of the data sheet HL-A560-1 for the helium leak test of cask TN-68-16 conducted October 9 and 10, 2002.

5. KSL procedure GZ-6630, "Polyester Resin Installation Procedure," Revision 1, paragraph 5.16, stated that the maximum concavity of the final resin pouring surface is 3 millimeters, and paragraph 7 required that visual examination of the final surface be recorded.

Contrary to the above, the resin pouring checklist, DT-A461-IR, "Dimensional Report," for cask TN-68-18 did not include items for the concavity measurement or visual inspection.

6. TN procedure 96-T-001, "Reactivity Test for Shielding Component," Revision 3, required that a reactivity test be repeated monthly when the accelerator component of the poured shielding mix had reached the manufacturer's maximum recommended shelf life.

Contrary to the above, a resin pour was performed for TN-68-16 on January 31, 2002, after the required accelerator monthly test had expired on December 26, 2001. Additionally, at least ten other shielding pours were done after the required accelerator monthly test had expired.

7. KSL procedures GI-0611, Revision 2, "NDE Procedure for NUHOMS 32 Dry Shielded Canister," and 44M-1412, Revision 0, "Painting Procedure (for TN-68 casks)," describe the process and controls for non destructive examinations (NDE) and painting respectively. The procedures use materials important to safety that have shelf life expiration dates.

Contrary to the above, the procedures do not require verification that the shelf life of the materials important to safety have not expired.

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

- C. 10 CFR 72.174, "Quality assurance records," requires, in part, that the certificate holder shall prescribe activities affecting quality by documented procedures, and that these procedures be followed.

ASME code sections NB 4321, 4322.1, and 4435 require that temporary attachment welds be made by qualified welders and that records of the joints welded be maintained.

Contrary to the above, there was no permanent record of the welder for clips attaching temporary stiffening rings to the shell inner diameter (welds numbered JX-1001) to cannister TN-68-21 at KSL.

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

- D. 10 CFR 72.150, "Instructions, procedures and drawings," requires, in part, that the certificate holder shall prescribe activities affecting quality by documented instructions, and that these instructions be followed.

10 CFR 72.174, "Quality Assurance Records," requires, in part, that records be maintained to furnish evidence of activities affecting quality, and that the records must include the monitoring of work performance.

Contrary to the above, during the NRC inspection, neither KSL nor HZ D&E had procedures describing the conduct of quality assurance surveillances or work monitoring, an activity affecting quality. Surveillances were performed without a procedure. Records were not maintained for the surveillances performed at KSL.

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

Pursuant to the provisions of 10 CFR 2.201, Transnuclear, Incorporated is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to Robert J. Lewis, Chief, Transportation and Storage Safety and Inspection Section, Licensing and Inspection Directorate, Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity

level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. Where good cause is shown, consideration will be given to extending the response time.

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.

Because 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), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, (the Public Electronic Reading Room). If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

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

Dated this 24th day of March, 2003.