

# NRC INSPECTION MANUAL

IRIB

---

## TEMPORARY INSTRUCTION 2515/173

---

### REVIEW OF THE IMPLEMENTATION OF THE INDUSTRY GROUND WATER PROTECTION VOLUNTARY INITIATIVE

CORNERSTONE: PUBLIC RADIATION SAFETY

APPLICABILITY: This Temporary Instruction (TI) applies to all holders of operating licenses for nuclear power reactors, including those plants which have permanently ceased operations.

NRR inspection staff will inspect operating plants (i.e. all holders of operating licenses for nuclear power reactors), and plants in decommissioning (i.e. those that have permanently ceased operations) if they are on the same site as those with operating reactors.

#### 2515/173-01 OBJECTIVES

The objective of this TI is to assess whether licensees have completed the voluntary industry Ground Water Protection Initiative. The Ground Water Protection Initiative (GPI) was unanimously approved by a formal vote of the Nuclear Energy Institute (NEI) member utility chief nuclear officers, which establishes the industry's commitment to implement the initiative. (Ref: ML062260198). The GPI identifies the actions the industry deems necessary for implementation of a timely and effective ground water protection program.

The NEI GPI is described in the document, "Industry Ground Water Protection Initiative – Final Guidance Document, August 2007" (Ref: ML072600292 and ML072610036). The information will be used to validate industry's implementation of the voluntary industry initiative and to aid in evaluating whether additional NRC regulatory actions are warranted.

#### 2515/173-02 APPLICABILITY

This TI applies to all holders of operating licenses for nuclear power reactors, including nuclear power reactors that have permanently ceased operations.

#### 2515/173-03 BACKGROUND

There have been multiple recent and historical groundwater contamination incidents of heightened NRC and public interest. As a result, the industry has taken action as specified in the NEI documents, "Industry Ground Water Protection Action Plan

Development Interim Guidance Document – June 2006: Action Plan Development (ML061950017) and Voluntary Communication Section (ML061950015)” and “Industry Ground Water Protection Initiative – Final Guidance Document, August 2007 (ML072600292 and ML072610036).”

Under the Interim GPI, each site was to develop a site-specific/company ground water protection program and implement voluntary communication programs by July 31, 2006. Under the final GPI, each site is to have developed an effective, technically sound ground water protection program by August 2008. In accordance with NUREG-BR-0075, Rev 4, Item 14, the purpose of this TI is to assess the licensee’s implementation of the industry GPI. Note: These industry actions are voluntary and generally beyond NRC requirements.

## 2515/173-04 INSPECTION REQUIREMENTS

The reporting format for this TI is provided in Appendix A. Inspection staff should complete Appendix A for each plant inspection by answering the questions provided in this section and submit the inspection results electronically to NRR/DIRS/IRIB Health Physics Team. These inspection requirements are to be conducted in part at NRC Regional Offices and in part at operating power reactor facilities.

### 04.01 Inspection Criteria for Ground Water Protection Program.

- a. Review and verify the implementation of the licensee’s written ground water protection (GPI) program based upon the groundwater protection criteria described in “Industry Ground Water Protection Initiative – Final Guidance Document, August 2007” (NEI-GPI).
- b. Improve management of situations involving inadvertent radiological releases that get into ground water.

### GPI Objective 1.1 - Site Hydrology and Geology.

Perform a site characterization of the geology and hydrology that provides an understanding of predominant ground water gradients based upon current site conditions.

Note: Technical questions related to site hydrology and geology should be referred to NRC headquarters.

- a. Have (new or updated) hydrogeologic and geologic studies been performed to determine the predominant ground water flow characteristics and gradients?
- b. As appropriate, have existing hydrogeologic and geologic studies, historical environmental studies, and permit or license related reports been reviewed (by knowledgeable utility or contractor staff? If practical, document the qualifications of the utility or contractor staff performing the reviews).
- c. Have potential pathways been identified for ground water migration from on-site locations to off-site locations through ground water?

- d. Has a frequency been established for periodic review of hydrogeologic studies (e.g., whenever there is substantial on-site construction, disturbance of site property, changes in on-site or nearby off-site use of water, or changes in on-site or nearby off-site pumping rates of ground water)?
- e. As appropriate, has the Final Safety Analysis Report been revised to include changes to the characterization of hydrology and/or geology?

#### GPI Objective 1.2 - Site Risk Assessment

- a. On a sampling basis (3-5 samples), have SSCs and work practices been identified that involves or could reasonably be expected to involve licensed material and for which there is a credible mechanism for licensed material to reach ground water?

Note: Some examples of SSCs are outdoor refueling water storage tanks, spent fuel pools, spent fuel pool leak detection systems, outdoor tanks, outdoor storage of contaminated equipment, buried piping, retention ponds, basins, or reservoirs, and steam lines. Some examples of leak detection methods for the SSCs are ground water monitoring, operator rounds, engineering walk downs or inspections, leak-detection systems, or periodic integrity testing.

- b. Have existing leak detection methods been identified for each SSC and work practice that involves or could reasonably be expected to involve licensed material and for which there is a credible mechanism for licensed material to reach ground water?
- c. Have potential enhancements been identified to leak detection systems or programs (e.g., increased frequency of rounds or walk downs, inspections, or integrity testing)?
- d. Have potential enhancements been identified to prevent spills or leaks from reaching ground water (e.g., resealing or paving surfaces or installing spill containment measures)?
- e. Has the mechanism or site process been identified for tracking corrective actions?
- f. Has a long term program been established to perform preventative maintenance or surveillance activities to minimize the potential for inadvertent releases of licensed materials due to equipment failure? Note: A detailed review of this long-term program is not required.
- g. Has a frequency been established for periodic reviews of SSCs and work practices?

### GPI Objective 1.3 - On-Site Ground Water Monitoring

Establish an on-site ground water monitoring program to ensure timely detection of inadvertent radiological releases to ground water.

- a. Based on the hydrology and geology studies, did the licensee consider placement of ground water monitoring wells down gradient from the plant but within the site boundary?
- b. Did the licensee consider, as appropriate, placing sentinel wells closer to SSCs that have the highest potential for inadvertent releases that could reach ground water or SSCs where leak detection capability was limited?
- c. Has the licensee established sampling and analysis protocols, including analytical sensitivity requirements for ground water and soil?
- d. Has a formal, written program been established for long term ground water monitoring? Was the site's ODCM/ODAM revised to include ground water monitoring locations that are included in the REMP?
- e. Have analytical capabilities (station or contract lab) been periodically reviewed or is there a plan to perform a periodic review?
- f. Has a long-term program been established for preventative maintenance of ground-water wells?
- g. Has a frequency been established for the periodic review of the ground water monitoring program?

### GPI Objective 1.4 - Remediation Process

- a. Have written procedures been established outlining the decision making process for the remediation of leaks and spills or other instances of inadvertent releases, and does the process consider migration pathways?
- b. Has an evaluation been made of the potential for detectible levels of licensed material from planned releases of liquids and/or airborne materials (e.g., rain-out and condensation)?
- c. As appropriate, has an evaluation been performed and documented on the decommissioning impacts resulting from remediation activities or the absence thereof (e.g., do licensee procedures include a decision making process to evaluate prompt remediation or delayed remediation and its impact on decommissioning)?

### GPI Objective 1.5 - Record Keeping

Ensure that records of leaks, spills, and remediation efforts are retained and retrievable to meet the requirements of 10 CFR 50.75(g).

- a. Has a record keeping program been established to meet the requirements of 10 CFR 50.75(g)? (see RIS 2002-02, "Lessons Learned Related to Recently Submitted Decommissioning Plans and License Termination Plans, Attachment 1, paragraph 8).

Note: During operations, residual radioactivity that would be significant for decommissioning planning would be a quantity of radioactive material that would later require remediation during decommissioning in order to terminate the license by meeting the unrestricted use criteria stated in 10 CFR 20.1402.

#### 04.02 Inspection Criteria for Communication

Improve communication with external stakeholders to enhance trust and confidence on the part of the local communities, States, NRC, and the public in the nuclear industry's commitment to a high standard of public radiation safety and protection of the environment.

##### GPI Objective 2.1 - Stakeholder Briefing

Each licensee should conduct initial and periodic briefings of their site specific GPI program with the designated State/Local officials.

- a. Have initial briefings been conducted with designated State and Local officials of the site specific GPI program? This determination can be accomplished by discussions with licensee staff.
- b. Have licensees considered including additional information or updates on ground water protection in periodic discussions with State/Local officials?
- c. For licensees that are in States where multiple nuclear power plants are located and multiple-owner companies have licensees coordinated efforts and communicated with each other?

##### GPI Objective 2.2 - Voluntary Communications

Make informal communication as soon as practical to appropriate State/Local officials, with follow-up notification to the NRC, regarding significant (i.e., of interest to public or stakeholders per NEI) on-site leaks and spills into ground water and on-site or off-site water sample results exceeding the criteria in the REMP.

- d. Leaks or spills - Have communications been made to designated State/Local officials before the end of the next business day?
  1. For spills or leaks exceeding 100 gallons from a source containing licensed material?

2. If the volume of a spill or leak cannot be quantified but is likely to exceed 100 gallons from a source containing licensed material?
  3. For any leak or spill, regardless of volume or activity, deemed by the licensee to warrant voluntary communication?
- e. Water sample results – Have communications been made to local authorities before the end of the next business day?
1. Of off-site ground water or surface water samples exceeding REMP reporting criteria for water as described in the ODCM/ODAM?
  2. Of on-site ground water, that is hydrologically connected to ground water, or ground water that is or could be used as a source of drinking water, that exceeds any of the REMP reporting criteria for water as described in the ODCM/ODAM?
- f. When communicating with the State/Local officials, are licensees clear and precise in quantifying the actual release information as it applies to appropriate regulatory criteria (i.e., put into perspective)?
- g. As appropriate, has the NRC been notified of voluntary communications to State and/or Local officials under 10 CFR 50.72(b)(2)(xi)?

#### GPI Objective 2.3 - Thirty Day Reports

Submit a written 30-day report to the NRC for any water sample results for on-site ground water that may be used as a source of drinking water that exceeds any of the criteria in the licensee's existing REMP as described in the ODCM/ODAM for 30-day reporting of off-site water sample results. Copies of the written 30-day reports for both on-site and off-site water samples should also be provided to the appropriate State/Local officials.

- a. Are ground water samples analyzed and compared to the standards and limits contained in the station's REMP as described in the ODCM/ADAM?
- b. Have any 30 day special reports been submitted to the NRC?
- c. Were any 30 day reports submitted to NRC also submitted to designated State/Local officials?

#### GPI Objective 2.4 Annual Reporting

Document all on-site ground water sample results and a description of any significant on-site leaks/spills into ground water for each calendar year in the Annual Radiological Environmental Operating Report (AREOR) for REMP or the Annual Radiological Effluent Release Report (ARERR) for the RETS as contained in the appropriate reporting procedure, beginning with the report for calendar year 2006.

a. Documentation

1. Were appropriate changes made to the ODCM/ODAM or to the appropriate procedures to support the 2007 report of 2006 performance for plants that were operating or decommissioning when the GPI was adopted?
2. Were all on-site ground water sample results and a description of any significant on-site leaks/spills into ground water for each calendar year reported in the AREOR or ARERR beginning with the report for calendar year 2006?

b. Sample Results

1. Have on-site ground water sample results taken in support of the GPI but are not part of the REMP program (e.g., samples obtained during the investigatory phase of the Action Plan circa year 2006) been reported in the ARERR as required by 10 CFR 50.36a(a)(2)? Note to Inspectors: Sampling data from long term, permanent wells that are put into the REMP program are reported in the Environmental Report. Similarly, data from test wells not placed into the REMP program are reported in the Effluent Report.
2. Have on-site ground water sample results taken in support of the GPI that are part of the REMP program as described in the ODCM/ODAM been reported in the AREOR?

c. Have annual reports (see <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html>) included the following:

1. For leaks and spills that were communicated to local/State authorities – does the ARERR contain a description of these spills and leaks?
2. For water sample results – have all on-site and off-site sample results that exceeded REMP reporting thresholds that were communicated to State/local officials also included in the ARERR and/or in the AREOR?

#### 04.03 Inspection Criteria for Program Oversight

Perform program oversight to ensure effective implementation of the GPI program.

##### GPI Objective 3.1 - Perform a Self Assessment of the GPI program

- a. Has an independent, knowledgeable individual performed the initial self assessment within one year of implementation (no later than December 31, 2008)?
- b. Are periodic self assessments of the GPI program planned for at least once every five years after the initial self assessment?

- c. Does the self assessment include an evaluation of the implementation of all of the GPI objectives?
- d. Is the self assessment documented in accordance with station procedures and programs?

#### GPI Objective 3.2 - Review the Program Under the Auspices of NEI

Conduct a review of the GPI program, including at a minimum the licensee's self assessments, under the auspices of NEI.

- a. Has an independent, knowledgeable individual performed the initial review within one year of the initial self assessment per Objective 3.1.a above?
- b. Have plans been established to perform a periodic review of the GPI program every 5 years, subsequent to the licensee's periodic self-assessment performed per Objective 3.1.b above?

#### 2515/173-05 REPORTING REQUIREMENTS

The results of the TI should be prepared for each licensee and submitted electronically upon completion to NRR/ADRO/DIRS/IRIB/IHPT.

#### 2515/173-06 COMPLETION SCHEDULE

This TI is to be initiated September 1, 2008 and completed by August 30, 2010.

#### 2515/173-07 EXPIRATION

This TI will remain in effect for 24 months (August 30, 2010).

#### 2515/173-08 CONTACT

Any technical questions regarding this TI should be addressed to NRR/DIRS/IRIB Health Physics Team.

#### 2515/173-09 STATISTICAL DATA REPORTING

All direct inspection effort expended on this TI is to be charged to 2515/173 for reporting by the HRMS system with an IPE code of TI.

#### 2515/173-10 ORIGINATING ORGANIZATION INFORMATION

10.01 Organizational Responsibility. This TI was initiated by the Health Physics Team in the Reactor Inspection Branch (NRR/ADRO/DIRS/IRIB).

10.02 Resource Estimate. It is anticipated that the resources needed to implement the TI requirements are estimated to be up to 40 hours of office and direct inspection. This TI can be performed in conjunction with the performance of the periodic baseline inspections performed for the radioactive liquid effluent treatment monitoring systems and the radiological environmental monitoring program (IP 71122.01 and 71122.03). Completion of this TI can be used to take credit for up to 16 hours of required baseline inspection for IP 71122.01 and 8 hours of required baseline inspection for IP 71122.03.

10.03 Training. Inspectors performing this inspection must meet the basic training for inspectors specified in IMC 1245, "Inspector Qualifications". However, if technical support is needed during the inspection, contact the IRIB Health Physics team.

## Appendix A

### TI Inspection Report

Date:

Inspection Report Number:

Site:

Docket/License Number:

#### 04.01 Inspection Criteria for Ground Water Protection Program

##### GPI Objective 1.1 - Site Hydrology and Geology

1.1.a     Yes    No    Comments:

1.1.b     Yes    No    Comments:

1.1.c     Yes    No    Comments:

1.1.d     Yes    No    Comments:

1.1.e     Yes    No    Comments:

##### GPI Objective 1.2 - Site Risk Assessment

1.2.a     Yes    No    Comments:

1.2.b     Yes    No    Comments:

1.2.c     Yes    No    Comments:

1.2.d     Yes    No   Comments:

1.2.e     Yes    No   Comments:

1.2.f     Yes    No   Comments:

1.2.g     Yes    No   Comments:

GPI Objective 1.3 - On-Site Ground Water Monitoring

1.3.a     Yes    No   Comments:

1.3.b     Yes    No   Comments:

1.3.c     Yes    No   Comments:

1.3.d     Yes    No   Comments:

1.3.e     Yes    No   Comments:

1.3.f     Yes    No   Comments:

1.3.g     Yes    No   Comments:

GPI Objective 1.4 - Remediation Process

1.4.a     Yes    No   Comments:

1.4.b     Yes    No   Comments:

1.4.c     Yes    No   Comments:

GPI Objective 1.5 - Record Keeping

1.5.a     Yes    No   Comments:

04.02    Inspection Criteria for Communication

GPI Objective 2.1 - Stakeholder Briefing

2.1.a     Yes    No   Comments:

2.1.b     Yes    No   Comments:

2.1.c     Yes    No   Comments:

GPI Objective 2.2 - Voluntary Communications

2.2.a     Yes    No   Comments:

2.2.a.i.    Yes    No   Comments:

2.2.a.ii.    Yes    No   Comments:

2.2.a.iii.  Yes  No Comments:

2.2.b  Yes  No Comments:

2.2.b.i.  Yes  No Comments:

2.2.b.ii  Yes  No Comments:

2.2.c  Yes  No Comments:

2.2.d  Yes  No Comments:

#### GPI Objective 2.3 - Thirty Day Reports

2.3.a  Yes  No Comments:

2.3.b  Yes  No Comments:

2.3.c  Yes  No Comments:

#### GPI Objective 2.4 - Annual Reporting

2.4.a.i  Yes  No Comments:

2.4.a.ii.  Yes  No Comments:

2.4.b.i  Yes  No Comments:

2.4.b.ii     Yes    No   Comments:

2.4.ci       Yes    No   Comments:

2.4.c.ii     Yes    No   Comments:

04.03    Inspection Criteria for Program Oversight

GPI Objective 3.1 - Perform a Self Assessment of the GPI program

3.1.a       Yes    No   Comments:

3.1.b       Yes    No   Comments:

3.1.c       Yes    No   Comments:

3.1.d       Yes    No   Comments:

GPI Objective 3.2 - Review the Program Under the Auspices of NEI

3.2.a       Yes    No   Comments:

3.2.b       Yes    No   Comments:

ATTACHMENT 1

Revision History for TI 2515/173  
 REVIEW OF THE IMPLEMENTATION ON GROUNDWATER PROTECTION INITIATIVE

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	05/29/08 CN 08-016	This TI is being issued to collect information on Industry's adherence to the Industry Ground Water Protection Initiative and verify if actions have been in accordance with the Initiative.	N/A	N/A	ML081090425