	QUALITY ASSURANCE SPECIFICATION	**QAS: 5.02**
		REVISION: 0
		DATE: 08/29/14
NONDESTRUCTIVE EXAMINATION		**PAGE 1 OF 7**

1.0 Purpose

The purpose of this specification is to establish the minimum quality assurance requirements for performing nondestructive examinations at NRG owned or operated facilities.

2.0 Scope

This specification applies to all Nondestructive Examination (NDE) services in any or all of the following areas: Radiographic testing, ultrasonic testing, magnetic particle testing, liquid penetrant testing, visual testing, surface replication testing, and eddy current testing.

3.0 Definitions

3.1 ASME – American Society of Mechanical Engineers

3.2 API – American Petroleum Institute

3.3 NRG – NRG Energy Inc.

3.4 NRG QA - The NRG individual responsible for the nondestructive examination aspects of the project

3.5 Nondestructive Examination Contractor – The Vendor performing the nondestructive examination

3.6 NRC – Nuclear Regulatory Commission

3.7 OSHA – Occupational Safety and Health Administration

4.0 References

4.1 ASME Boiler & Pressure Vessel Code, Section I, “Rules for Construction of Power Boilers”

4.2 ASME Boiler & Pressure Vessel Code, Section V, “Nondestructive Examination”

4.3 ASME Boiler & Pressure Vessel Code, Section IX, “Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators”

4.4 ASME B31.1, “Power Piping”

4.5 SNT-TC-1A, “Personnel Qualification and Certification in Nondestructive Testing”

4.6 NRC 10 CFR Part 34, “Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operations”

4.7 OSHA 29 CFR Part 1910, “Occupational Safety and Health Standards”

4.8 OSHA 29 CFR Part 1926, “Safety and Health Regulations for Construction”

5.0 Responsibility

5.1 The Nondestructive Examination Contractor shall provide qualified and certified personnel, written procedures, properly calibrated equipment, and the materials to perform nondestructive examinations for NRG, in accordance with ASME and API compliant procedures.

5.2 The Nondestructive Examination Contractor shall conduct examinations in accordance with approved procedures.

5.3 The Nondestructive Examination Contractor shall provide personnel that are familiar with and have been trained to the applicable NRG Safety Programs detailed in Section 8.0.

5.4 NRG is responsible for identifying the applicable code for the work being performed and advising the Nondestructive Examination Contractor accordingly.

6.0 General

6.1 NRG may request submittal of resumes of personnel proposed for a work assignment, for review and approval prior to the start of work. Resumes shall provide information on education, formal NDE training, NDE experience, and references, along with NDE certification documentation. Resumes will be held in strict confidence.

6.2 Examination personnel may be interviewed and tested, as appropriate, by NRG.

6.3 Individuals contracted shall report to the assigned NRG facility, as required.

6.4 The Nondestructive Examination Contractor must have experience and show qualifications in those areas for which their services are proposed.

6.5 The Nondestructive Examination Contractor's personnel must have experience in nondestructive examination of fossil power plant components.

6.6 Personnel shall be qualified and certified in accordance with the contractor's written practice, meeting SNT-TC-1A (the latest edition recognized by the referencing code section). They shall also meet the following requirements as applicable:

6.6.1 Lead radiographers shall be qualified and certified to SNT-TC-1A, Level II or III, and have Gamma-Ray experience to the requirements set forth in ASME Section V, Article 2, and in radiography of butt-welded joints. The Lead radiographer shall have had experience interpreting radiographic film to the accept-reject criteria established by ASME Sections I, VIII, IX, and ASME B31.1.

6.6.2 Whenever radiography is performed at a NRG facility, the radiographer and the assistant radiographer shall meet the requirements of NRC 10 CFR Part 34, "Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operations." The radiographer must be accompanied by at least one other qualified radiographer or an individual who has at a minimum met the requirements of Paragraph §34.43 (c) of NRC 10 CFR Part

34. The additional qualified individual shall observe the operations and be capable of providing immediate assistance to prevent unauthorized entry. Radiography may not be performed if only one qualified individual is present.

6.6.3 Individuals performing ultrasonic examination shall have had experience in the areas of thickness measurement and flaw detection and sizing in accordance with ASME Section V, Articles 4 and 5, and shall be qualified and certified as SNT-TC-1A, Level II or III.

6.6.4 Individuals assisting Level II or III ultrasonic examiners shall be qualified and certified as SNT-TC-1A, Level I, II, or III.

6.6.5 Magnetic particle examiner(s) shall have had experience in both the wet and dry techniques and shall be qualified and certified as SNT-TC-1A, Level II or III.

6.6.6 Individuals assisting Level II or III magnetic particle examiners shall be qualified and certified as SNT-TC-1A, Level I, II, or III.

6.6.7 Liquid penetrant examiner(s) shall have had experience in color-contrast and fluorescent techniques at both standard and non-standard temperatures, and shall be qualified and certified as SNT-TC-1A, Level II or III.

6.6.8. Individuals assisting Level II or III liquid penetrant examiners shall be qualified and certified as SNT-TC-1A, Level I, II, or III.

6.6.9 Prior to arrival at a designated generating station, the contractor shall provide to the NRG site representative, the NDE technician's specific qualification and certification records, current eye examinations, and the applicable NDE procedures for review and approval.

7.0 Documentation

7.1 The original of NDE reports, comments, and other documents shall be prepared as requested by NRG QA and submitted for further action.

7.2 The contents of the report (s) belong solely to NRG and may not be released to other persons, companies, associations, or other organizations without prior written permission.

7.3 A copy of all other documents obtained from vendors or other sources, or developed by the Nondestructive Examination Contractor in pursuance of work charged under the purchase order, or used in support of the purchase order, shall be provided to NRG QA for retention. Documents referred to shall include, but are not limited to, the following:

7.3.1. Letters or other documents, and comments to and from suppliers, bidders, or other sources.

7.3.2 Report of conferences, trips, programs, status, or other pertinent matters.

7.3.3 The Nondestructive Examination Contractor shall provide copies of all procedures implementing the safety and hazardous waste requirements in paragraphs 8.0 and 9.0.

7.3.4 Procedures, processes, specifications, catalogues, brochures, or other software needed to support the purchase order.

8.0 Safety

8.1 NRG's boiler and gas pass areas may contain arsenic; and, because personnel may be required to enter these areas, the contractor shall ensure that the OSHA requirements for working in arsenic areas are being met for all personnel supplied under this contract. These requirements include **written** arsenic and respirator procedures, which contain provisions for:

8.1.1 Training in the hazards of arsenic and the proper selection and wearing of respirators.

8.1.2 Periodic medical evaluation of personnel for ability to wear respirators.

8.1.3 Wearing special protective clothing.

8.1.4 Semi-annual respirator fit testing.

8.1.5 Taking a shower after work.

Additional details may be found in the OSHA regulations, 29 CFR, Parts 1910.134 and 1910.1018

8.2 The personnel supplied under this specification will be required to work in Permit Required Confined Spaces, as described in OSHA regulation Part 1910.146. The Nondestructive Examination Contractor shall have a written procedure implementing these regulations and ensure that all personnel have been trained in the applicable requirements, and NRG's confined space entry program.

8.3 The personnel supplied under this specification must be physically capable of working in a power plant environment and be capable of climbing ladders and working on scaffolding and in close quarters (inside a tank). Personnel selected must wear approved hard hats, industrial footwear, ear protection, and safety glasses with side shields.

8.4 The personnel supplied under this specification shall have been trained in the requirements listed for employees who "work" on scaffolds in accordance with OSHA 29 CFR Part 1926 Subpart L, paragraph 1926.454, and trained as well in fall protection (OSHA 29 CFR 1926, paragraph 1926.500 through paragraph 1926.503, and paragraph 1910.269).

8.5 The Nondestructive Examination Contractor shall provide <u>all</u> necessary safety-related equipment, such as respirators, air monitoring instruments, low-voltage lights for tank work, ground fault circuit interrupters, and the equipment described in Paragraph 8.3 above.

8.6 If the person(s) supplied under this specification will be exposed to flames or electric arcs, the contractor shall ensure their clothing meets the OSHA requirements in 29 CFR, Part 1910, Subpart R, Section 1910.269, and paragraph (1) (6) iii.

8.7 If work covered by this specification involves radiographic examination, in addition to the requirements of NRC 10 CFR Part 34 and their own internal procedures, the Nondestructive Examination Contractor shall ensure that all personnel are familiar with and trained in the applicable requirements of NRG's Radiation Safety Program.

9.0 Hazardous Waste

The contractor shall contain and then remove all waste generated by his work from NRG's property and dispose of it in accordance with the contractor's procedures. This includes cans of nondestructive testing material such as cleaner, developer, and penetrant for liquid penetrant inspection or chemicals for radiographic film development.

10.0 Attachments

None