Maria Korsnick
Vice President

1503 Lake Road
Ontario, New York 14519-9364
585.771.3494
585.771.3943 Fax
maria.korsnick@constellation.com

Constellation Energy
R.E. Ginna Nuclear Power Plant

June 10, 2005

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

ATTENTION: Document Control Desk

SUBJECT: **R.E. Ginna Nuclear Power Plant**
Docket No. 50-244

Response to First Revised Order EA-03-009 and Bulletin 2003-02

By letter dated March 8, 2004, Ginna committed to perform inspections of the reactor vessel (upper) head during refueling outages beginning in 2005, and submit written documentation of these inspections within 60 days after returning the plant to operation. The first set of inspections was completed during the Spring 2005 refueling outage. Results are provided in Attachment 1.

By letter dated September 19, 2003, Ginna committed to perform bare-metal inspections of all lower head penetrations, with appropriate documentation, beginning with the 2003 refueling outage, and each subsequent refueling outage. These inspections with documentation would continue until changes to the ASME Code or industry recommendations justified a change in examination frequency. Results of this inspection are provided in Attachment 2. The issue related to paint removal efforts are provided in Attachment 3.

A listing of Regulatory Commitments is provided in Attachment 4. If you have any questions, please contact George Wrobel at (585) 771-3535 or george.wrobel@constellation.com.

Very truly yours,

Mary G. Korsnick

Mary G. Korsnick

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A109

STATE OF NEW YORK :
: **TO WIT:**
COUNTY OF WAYNE :

I, Mary G. Korsnick, being duly sworn, state that I am Vice President – R.E. Ginna Nuclear Power Plant, LLC (Ginna LLC), and that I am duly authorized to execute and file this response on behalf of Ginna LLC. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other Ginna LLC employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

Mary G. Korsnick

Subscribed and sworn before me, a Notary Public in and for the State of New York and County of Monroe, this 10 day of June, 2005.

WITNESS my Hand and Notarial Seal:

Michalene A. Bunts
Notary Public

My Commission Expires:

January 11, 2007
Date

MICHALENE A BUNTS
Notary Public, State of New York
Registration No. 01BU6018576
Monroe County
Commission Expires Jan 11, 2007

Attachments:

Cc: S. J. Collins, NRC
D. M. Skay, NRC
Resident Inspector, NRC

Mr. Peter R. Smith
New York State Energy, Research, and Development Authority
17 Columbia Circle
Albany, NY 12203-6399

Mr. Paul Eddy
NYS Department of Public Service
3 Empire State Plaza, 10th Floor
Albany, NY 12223-1350

ATTACHMENT 1

Response to the First Revised Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors dated February 20, 2004.

Ginna replaced the reactor pressure vessel (RPV) closure head during the 2003 refueling outage with improvements in CRDM housing materials and weld metal. The RPV head is constructed from a single piece forging eliminating the flange to dome plate weld. The CRDM penetration and instrumentation housings of the RPV head are manufactured from thermally treated Alloy 690 material. A small leak chase above the penetration to head attachment weld is provided to ensure any leakage past the pressure boundary can be detected on top of the head by visual examination methods. The welds of the penetrations to the RPV head were made utilizing Alloy 690 weld material which is designated 52/152 material. The welding process was an automated Tungsten Inert Gas water cooled process.

Ginna responded to the First Revised Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors, by letter dated March 8, 2004. One Ginna regulatory commitment made was to perform inspections of the reactor vessel head per Section IV.C of the revised order. The applicable excerpt is below.

(4) For those plants in the Replaced category, no RPV head and head penetration nozzle inspections shall be required during the outage for which the RPV head was replaced. Thereafter, until the replacement RPV head in accordance with paragraph IV.A reaches 8 EDY, RPV head and head penetration nozzle inspections shall be performed as follows. An inspection meeting the requirements of paragraph IV.C.(5)(a) must be completed at least every third refueling outage or every 5 years, whichever occurs first. The requirements of paragraph IV.C.(5)(b) must be completed at least every 4 refueling outages or every 7 years, whichever occurs first.

Ginna conservatively performed a bare metal examination during the 2005 refueling outage, which is the first outage after RPV head replacement, to establish a baseline. This examination fully met the requirements of paragraph IV.C.5 of the revised NRC order. This examination consisted of 100% bare metal and 360° around each RPV nozzle. This examination utilized the "Thor" remotely operated crawler with ¼" CCD camera with auto iris and manual lighting control. The scope of work included 32 CRDM nozzles, 3 CETNA nozzles, 1 reactor vessel head vent nozzle, and one reactor vessel RVLIS nozzle. A VT-1 examination resolution was obtained around each nozzle annulus with the "Thor" crawler, and a VT-3 general bare metal head examination was obtained with a general area camera. This examination was performed in accordance with Ginna

procedure VT-116 revision 8 which requires a level II qualified examiner at a minimum. All visual examination data was recorded on digital tape for archive and future examination comparison. Nozzle locations were referenced from manufacturing drawings and the nozzle unique stampings were confirmed on camera. All nozzles have the nozzle number stamped at approximately 90° and 270°. The condition of the Ginna RPV head after one cycle of operation was found to be generally clean, with some minor insulation fibers on the head surface and small discrete amounts of debris on the uphill side of the nozzles as visually magnified by the "Thor crawler". Neither the insulation fibers, nor minor debris caused any masking during the examination. The insulation fibers were able to be seen only with the magnified resolution of the crawler; a direct visual examination could not detect these fibers. While reviewing the inspection data an observation was made that there was an absence of some of the fibers in discrete areas. These "trails" were determined not to be a deposition of material, but rather a lack of minute fiber deposits. These areas were labeled as "Opaque trails" in the inspection report. These opaque trails were primarily on the base metal though in some cases interaction with the nozzles was also made. There was no buildup of concentrated deposition indicative of RCS leakage. After reviewing the inspection video thoroughly it became apparent the head had been wetted. The distinct direction of these opaque trails appeared to defy both gravity and RPV head ventilation direction forces – it was thus surmised that these trails could only have formed while the head was tipped on its side, such as when it was moved during the 2003 outage into containment. The weather was rainy during this evolution. Documentation indicating how the head was rigged during head replacement confirmed the flow directions with orientation of the head on the up-ender during transport.

Another observation made during the RPV head inspection was the indication of small amounts of boric acid flow, as well as an indication of a small whitish deposit at CRDM nozzle 27. It was determined that an outside source of boric acid was deposited on the head, and tracked its way across nozzles 19, 23, and 27. Localized minute depositions of this material collected at sites consistent with gravity forces (bottom of the nozzle) or at localized imperfections along the head surface. With camera support, chemistry samples of the deposit were obtained. It was apparent that these samples were not tightly adhering to the vessel surface since they readily attached themselves to the retrieval tool. Also, the composition of this discrete deposit was such that it crumbled when the sample was gathered. This provided evidence that the deposit did not form from RCS leakage, which would be very concentrated boric acid which would tend to stay intact when interacted with. Both of these points make it highly unlikely that the crystalline material came from the nozzle annulus under RCS operating conditions. The deposition most likely occurred under cold conditions. This information is inferred from the relatively long trail, on the order of 2' (from the top of nozzle 19 to below nozzle 27) of the boric acid flow. Under hot conditions, the flow would have been very short and evaporation would have occurred.

Radioisotopic analysis of the composite samples taken on upper head was performed. The results indicated that there was cross contamination from a source somewhere in containment. The identification of the short lived Cr-51 sample indicated there was the probability of a source which was only days old. Additionally the Co-58/Co-60 ratio was consistent with the contamination levels found in the reactor cavity during its decontamination. Based on this information, the most likely source of the particle is the cross contamination from the reactor cavity as a result of its aggressive decontamination.

The conclusion is that the Ginna RPV head and RPV head nozzles have maintained their RCPB integrity during the previous cycle. Follow-on inspection activity will be performed in accordance with paragraph IV.C.5 of the revised NRC order. However, due to the localized deposit at nozzle 27, Ginna is also committing to perform a bare metal visual VT-1 quality inspection of the Nozzle 27 head area and 360° around nozzle 27 for comparison to the 2005 baseline inspection during the 2006 refueling outage.

Another Ginna commitment made to the First Revised Order (EA-03-009) was to perform inspections above the reactor vessel head per Section V.D. The applicable excerpt is below.

D. During each refueling outage, visual inspections shall be performed to identify potential boric acid leaks from pressure-retaining components above the RPV head. For any plant with boron deposits on the surface of the RPV head or related insulation, discovered either during the inspections required by this Order or otherwise and regardless of the source of the deposit, before returning the plant to operation the Licensee shall perform inspections of the affected RPV head surface and penetrations appropriate to the conditions found to verify the integrity of the affected area and penetrations.

In addition to the bare metal visual on the RPV head described above, Ginna performed a general examination of all accessible surfaces above the RPV head for leakage. No leakage was detected. The Ginna replacement head has a Head Assembly Upgrade Package (HAUP) that took into consideration getting access to these areas through the two sets of access doors that are at two separate levels above the RPV head insulation, window ports, and vent duct connections. This allowed general access to all seal weld locations that exist on the replaced L106 Control Rod Drive Mechanisms. Additional examination areas such as Core Exit Thermocouple locations, head vent, and RVLIS valves were also inspected for leakage sources. This examination was performed in accordance with Ginna procedure VT-116 revision 8 which requires a level II qualified examiner at a minimum. Based on examination results the pressure boundary areas above the RPV head has maintained integrity during the previous cycle.

ATTACHMENT 2

Reactor Pressure Vessel Lower Head Penetration 2005 Refueling Outage Examination and status reports.

During the Ginna 2005 refueling outage the reactor vessel lower head insulation was lowered to perform a bare metal visual examination. Four separate temporary support assemblies were built out of scaffolding which attached to the handrail on the "A" sump platform. A winch was attached to each one of the four support assemblies, the straps were connected to an attachment ring at the center of the vessel bottom. The insulation was disassembled at an L bracket flange which accomplished lowering the insulation surrounding the bottom mounted instrumentation nozzles as one assembly. The straps were locked in place to support the insulation.

Each bottom mounted instrumentation nozzle has an Inconel weld pad around it on the vessel exterior which was ground flush and examined with penetrant testing and ultrasonic testing during original manufacturing. The reactor vessel bottom has a Koppers Hi Heat Gray paint which was applied during manufacturing. The paint was in good condition and covered the weld pads and most of the bottom mounted instrumentation nozzle interface/annulus.

The visual examination was accomplished utilizing a Micro Video MVC2120 waterproof tube color camera attached to an inspection pole with an articulating joint for improved scanning capabilities. The camera has an auto iris with a manual focus. The camera focus was calibrated off a VT-1 character card with .044" high characters. This was intended to provide an examination range of 3" to 6" while still maintaining VT-1 character resolution. The camera has 6 white LED lights surrounding the camera lens housed within the camera enclosure to provide lighting. Tube lights were placed on the inside of the lowered insulation for auxiliary lighting. The complete examination was video taped for evaluation and future reference. This examination was performed in accordance with Ginna procedure VT-116 revision 8 which requires a level II qualified examiner at a minimum.

The bottom mounted instrumentation nozzles have unique identifications vibra-etched just above the thimble tube socket weld, which were marked during manufacture. All tubes were identified by marking the unique identifier and temporarily attaching it to the nozzle. These were video taped as part of the examination. All tubes were confirmed off drawing locations and verified from known marked BMI nozzles to assure 100% of nozzles were examined.

Sixteen (16) of the thirty six (36) bottom mounted instrumentation (BMI) nozzles were examined at VT-1 quality resolution 360 ° around the circumference for a minimum of 1" radius around the tube to shell interface/annulus. The balance of 20 nozzles were inspected with a VT-3 quality resolution 360 ° around the circumference for a minimum of 3" radius around the tube to shell interface/annulus. The results indicate the Ginna RPV lower vessel head had no RCS pressure boundary leakage. The annulus area was predominantly painted and the paint was intact and had not changed from the previous inspection in 2003 as discussed in our letter of December 9, 2003 and accepted in the NRC's SER of November 8, 2004. Evidence of thin translucent dry Boric Acid leakage was noted and the source of leakage was identified as cavity seal leakage from a

previous outage. A 100% general base metal inspection with a combined VT-2/VT-3 quality resolution was also performed on the painted base material between the penetrations and above the penetrations. Very small areas of flaking and light corrosion were noted on the base metal as well as indications of thin translucent dry boric acid. These areas had not changed since the 2003 RFO. Areas of discrete boric acid indication islands on the order of ¼" diameter were identified above the insulation flange which is located well above (approximately 18") the outer most penetration. These areas were considered to be of interest for general area inspection, though out of the area of interest for vessel head BMI penetration leakage detection.

Primary chemistry sampled these localized base metal areas to ascertain the material and origination of the white deposit material. Four samples of particulate material, four wet smears, and one sample of paint flakes were analyzed in accordance with the MRP industry whitepaper document; "Sampling and Analysis Guidance for Deposits Found on Reactor Pressure Vessels at Various Locations". The absence of any short-lived (< 6 month half-life) radionuclides commonly found in the RCS supports the conclusion that there has been no leakage of reactor coolant through the penetrations. All gamma spectroscopic analysis demonstrates that the deposits have been out of contact with the Reactor Coolant System for greater than four years.

Based on these examination results, the lower vessel head pressure boundary areas had maintained its RCPB integrity during the previous cycle.

Attachment 3

Reactor Pressure Vessel Lower Head Penetration annulus paint removal status report.

During the 2005 Ginna refueling outage the issue of paint covering the annulus of the reactor vessel BMI nozzles was identified. It was surmised that the paint could delay the detection of boric acid leakage from the lower head nozzle area. The Koppers Hi Heat Gray paint that was applied during manufacturing was specifically selected for its properties to withstand high temperatures. Koppers has proven to be very protective for the carbon steel base metal, and is typical of a galvanic type of coating. The paint is still intact and in excellent shape on an estimated 99% of the Ginna lower vessel head. The Koppers has a grey matte finish which provides an excellent background from which to discern concentrated white deposits that would result from RCS pressure boundary leakage. The paint is designed to adhere to the metal surface and when a bridging occurs in the nozzle annulus it is designed to stay intact when not exerted to any significant load or differential movement. However, if an RCS leak developed at a BMI nozzle, a resultant pressure gain would be seen in the annulus region. This would result in a shear force upon the Koppers paint covering the annulus, and since the paint is brittle when subjected to a shear force, unlike an epoxy polyamide, it would likely result in cracking or delamination in the gap areas. There is confidence that paint failure would occur at the higher pressure that would be associated with RCS leakage within the annulus, and that leak detection would not be delayed.

Nonetheless, Ginna is continuing to pursue efforts to remove or minimize the paint thickness in the annulus area during the 2006 refueling outage. This was discussed during a telecon between Ginna and the NRC on May 20, 2005. The area of interest is being defined as the very thin annulus area around each nozzle. No planned attempt will be made to remove paint from the Inconel 600 nozzle locations, or around the I82 weld pads located on the vessel exterior. Since the paint might have wicked into the annulus slightly depending on the application variables, removal of paint bridging the annulus gap on the surface will be attempted with the emphasis being to minimize the paint thickness to the extent possible. We maintain awareness of the fact that we do not want to create a detrimental material effect on a sensitive location by removing the paint with an excessive force removal process. A project plan has been written to address selecting a removal process and optimizing that process for Ginna-specific paint removal. We plan to qualify that process through the use of representative mockups to optimize paint removal and minimize detrimental effects. The qualification will provide assurances through material analysis and testing, that the process is safe to use for personnel and plant equipment. Considering the requirements of 10CFR20, it would not be prudent to embark on a dose intensive operation without adequate time to perform mockups and assessments that would be likely to significantly improve ALARA parameters. Ginna will also document the extent of representative paint wicking that occurs in the mockups through normal application procedures and capillary action.

In parallel, Ginna is researching the use of NDE techniques, such as UT, which could be applied during the next 10-year reactor vessel ISI. Further detailed communications with the NRC staff will also occur as progress is made in these efforts, with a progress report on our paint removal efforts scheduled by November 1, 2005.

Attachment 4

List of Regulatory Commitments

The following table identifies those actions committed to by Ginna LLC in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Mr. George Wrobel, Director Nuclear Safety and Licensing, (585) 771-3535.

REGULATORY COMMITMENT	DUE DATE
Perform VT-1 quality inspection of the nozzle 27 head area and 360° around nozzle 27.	2006 refueling outage (RFO)
Provide progress report on program to remove or minimize paint thickness in thin annular areas around BMI penetrations.	November 1, 2005