Exelon Generation
4300 Winfield Road
Warrenville, IL 60555

www.exeloncorp.com

Exelon Nuclear

RS-03-009

January 17, 2003

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Request for Exemption from the Provisions of 10 CFR 50.44, 10 CFR 50.46 and 10 CFR 50 Appendix K for One Lead Test Assembly; and Request for an Increase in the Rod-Average Burnup Limit for Four Fuel Assemblies

References:
(1) Letter from Mr. J. B. Hickman (NRC) to Mr. O. D. Kingsley, (Commonwealth Edison Company), "Issuance of Exemption from the Requirements of 10 CFR 50.44, 10 CFR 50.46, and 10 CFR Part 50, Appendix K – Byron Station, Units 1 and 2 (TAC Nos. MA3930 and MA3931)," February 26, 1999

(2) Letter from NRC to John L. Skolds (Exelon Generation Company, LLC), "Byron Station, Units 1 and 2, and Braidwood, Station Units 1 and 2 – Issuance of Amendments (TAC NOS. MB3013, MB3014, MB3011, and MB3012)," dated April 19, 2002

In accordance with 10 CFR 50.12, "Specific exemptions," Exelon Generation Company, LLC (EGC) is requesting a temporary exemption from the requirements of 10 CFR 50.44, "Standards for combustible gas control system in light-water-cooled power reactor," 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," and 10 CFR 50 Appendix K, "ECCS Evaluation Models," for Byron Station, Unit 1, Cycle 13.

As the nuclear industry pursues longer operating cycles with increased fuel discharge burnups and more aggressive fuel management, the corrosion performance requirements for the nuclear fuel cladding becomes more demanding. Available industry data from the American Nuclear Society, the International Atomic Energy Agency, the Electric Power Research Institute and Westinghouse Electric Company, LLC (Westinghouse) indicate that corrosion resistance improves for cladding with a lower tin content. To gather data on cladding material with a lower tin content, Westinghouse has developed a lead test assembly (LTA) program in cooperation with EGC.

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EGC, with Westinghouse support, is providing justification for an exemption request related to the use of a limited number of "lower tin" ZIRLO™ clad replacement fuel rods in one LTA (i.e., LTA M09E). 10 CFR 50.44 and 10 CFR 50.46 specifically refer to fuel with Zircaloy or ZIRLO cladding; and paragraph I.A.5 of 10 CFR 50 Appendix K references an analysis which utilizes

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the Baker-Just equation which assumes the use of a zirconium alloy different than "lower tin" ZIRLO™ used in the replacement rods. Therefore, 10 CFR 50.44, 10 CFR 50.46, and 10 CFR 50 Appendix K do not specifically apply to the proposed replacement rods since the composition of tin in the replacement rods will be below the lower bound licensed limit of ZIRLO™. The licensed limit of ZIRLO™ is specified in Appendix A of Westinghouse Topical Report, WCAP-12610-P-A, "VANTAGE + Fuel Assembly Reference Core Report," dated April 1995. This LTA is scheduled to be inserted into the Byron Station, Unit 1 Cycle 13 core that will begin operation in October 2003. This exemption is requested only for Unit 1 Cycle 13.

10 CFR 50.12, "Specific exemptions," states that the NRC may grant exemptions from the requirements of the regulations of part 50 provided:

1. the exemption is authorized by law;
2. the exemption will not present an undue risk to the public health and safety;
3. the exemption is consistent with the common defense and security; and
4. special circumstances are present.

This exemption request satisfies these criteria as detailed in Attachment 1. Attachment 1 also presents a technical discussion addressing the acceptability of "lower tin" ZIRLO™. Note that the NRC has previously approved a similar exemption request for Byron Station as described in Reference 1.

In addition, we are also requesting NRC approval to irradiate two Lead Test Assemblies (LTAs) (i.e., M09E and M12E) and two "standard" Westinghouse 17x17 VANTAGE+ ZIRLO™ assemblies (i.e., M10E and M11E) beyond the current fuel rod-average licensing basis burnup limit of 60,000 megawatt-days per metric tonne Uranium (MWD/MTU), up to 69,000 MWD/MTU. There is no Technical Specification that imposes a limit on fuel rod burnup; however, Byron and Braidwood Stations have a licensing basis commitment that limits the current fuel rod-average burnup to ≤ 60,000 MWD/MTU. This licensing basis commitment is documented in the NRC Safety Evaluation supporting Amendments 78 and 70 for Byron and Braidwood Stations respectively, dated December 19, 1995. These amendments approved the use of ZIRLO™ fuel cladding. Irradiation of these four assemblies is intended to confirm the acceptable use of the ZIRLO™ alloy to a discharge burnup level exceeding the current licensing basis. The projected fuel rod-average burnup of these four fuel assemblies at the end of Byron Station Unit 1 Cycle 13 will be approximately 67,000 MWD/MTU (69,000 MWD/MTU including margin for potential coast down). Justification to extend the burnup limit to 69,000 MWD/MTU is presented in Attachment 2. The NRC previously approved a similar high burnup request for Byron Station as described in Reference 2.

We request that the exemption request to use lower tin ZIRLO™ rods in LTA M09E and the request to exceed the current fuel burnup limit for four fuel assemblies be approved by August 1, 2003, in order to support Byron Station, Unit 1 Cycle 13 operations scheduled to begin in October 2003.

Attached for your review are the following documents:

1. One copy of Attachment 1, "Request for Exemption from the Provisions of 10 CFR 50.44, 10 CFR 50.46 and 10 CFR 50 Appendix K For Replacement Fuel Rods in One Lead Test Assembly (LTA) with Supporting Justification, Byron Station Unit 1," (Proprietary), January 2003

2. One copy of Attachment 1, "Request for Exemption from the Provisions of 10 CFR 50.44, 10 CFR 50.46 and 10 CFR 50 Appendix K For Replacement Fuel Rods in One Lead Test Assembly (LTA) with Supporting Justification, Byron Station Unit 1," (Non-Proprietary), January 2003

3. One copy of Attachment 2, "Request for Approval of Fuel Rod Burnup Beyond the Current Licensing Basis, Byron Station Unit 1," (Proprietary), January 2003

4. One copy of Attachment 2, "Request for Approval of Fuel Rod Burnup Beyond the Current Licensing Basis, Byron Station Unit 1," (Non-Proprietary), January 2003

Items 1 and 3 contain information proprietary to Westinghouse Electric Company; therefore, we are requesting that this information be withheld from public disclosure. Accordingly, an affidavit signed by Westinghouse Electric Company, LLC, a Delaware limited liability company and the owner of the information, is provided setting forth the basis on which the information may be withheld from public disclosure by the NRC and addressing the considerations listed in paragraph (b)(4) of 10 CFR 2.790, "Public inspections, exemptions, requests for withholding."

Also enclosed are a Westinghouse authorization letter, CAW-03-1594, Proprietary Information Notice and Copyright Notice.

Should you have any questions regarding this submittal, please contact Mr. J. A. Bauer at (630) 657-2801.

Respectfully,

Keith R. Jury

Keith R. Jury
Director – Licensing
Mid-West Regional Operating Group

Attachments:

Attachment 1: "Request for Exemption from the Provisions of 10 CFR 50.44, 10 CFR 50.46 and 10 CFR 50 Appendix K For Replacement Fuel Rods in One Lead Test Assembly (LTA) with Supporting Justification, Byron Station Unit 1," (Proprietary and Non-Proprietary Versions), January 2003

Attachment 2: "Request for Approval of Fuel Rod Burnup Beyond the Current Licensing Basis, Byron Station Unit 1," (Proprietary and Non-Proprietary Versions), January 2003

Westinghouse Letter, CAW-03-1594
Affidavit
Proprietary Information Notice
Copyright Notice

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Braidwood Station
NRC Senior Resident Inspector – Byron Station
Office of Nuclear Facility Safety – Illinois Department of Nuclear Safety

Westinghouse

Westinghouse Electric Company
Nuclear Services
P.O Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

U S Nuclear Regulatory Commission
ATTN· Document Control Desk
Washington, DC 20555

Direct tel: 412/374-5282
Direct fax: 412/374-4011
e-mail Sepp1ha@westinghouse com

Attention: J. S Wermiel, Chief
Reactor Systems Branch
Division of Systems Safety and Analysis

Our ref CAW-03-1594

January 03, 2003

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject· Byron Station, Units 1 and 2, Facility Operating License Nos. NPF-37 and NPF-66, NRC Docket Nos STN 50-454 and STN 50-455, Request for Exemption from the Provisions of 10 CFR 50.44, 10 CFR 50 46 and 10 CFR 50 Appendix K for One Lead Test Assembly; and Request for an Increase in the Rod-Average Burnup Limit for Four Fuel Assemblies

Dear Mr Wermiel:

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-03-1594 signed by the owner of the proprietary information, Westinghouse Electric Company LLC, a Delaware limited liability company ("Westinghouse"). The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2 790 of the Commission's regulations

Accordingly, this letter authorized the utilization of the accompanying Affidavit by Exelon Generation Company, LLC for Byron Station, Units 1 and 2.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-03-1594, and should be addressed to the undersigned.

Very truly yours,

Henry A. Sepp, Manager
Regulatory and Licensing Engineering

CAW-03-1594

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared Henry A Sepp, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC, a Delaware limited liability company ("Westinghouse") and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief·

MARGARET L. GONANO
COMMONWEALTH OF PENNSYLVANIA
NOTARY PUBLIC

Henry A Sepp, Manager
Regulatory and Licensing Engineering

Sworn to and subscribed
before me this 3rd day
of January, 2003.

Margaret L. Gonano
Notary Public

Notarial Seal
Margaret L. Gonano, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires Jan. 3, 2006
Member, Pennsylvania Association Of Notaries

(1) I am Manager, Regulatory and Licensing Engineering, in Nuclear Services, of the Westinghouse Electric Company LLC, a Delaware limited liability company ("Westinghouse") and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rulemaking proceedings, and am authorized to apply for its withholding on behalf of the Westinghouse Electric Company.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.790 of the Commission's regulations and in conjunction with the Westinghouse application for withholding accompanying this Affidavit

(3) I have personal knowledge of the criteria and procedures utilized by the Westinghouse Electric Company in designating information as a trade secret, privileged or as confidential commercial or financial information

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g , by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable

There are sound policy reasons behind the Westinghouse system which include the following.

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

b) It is information which is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.790, it is to be received in confidence by the Commission

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in "Byron Station, Units 1 and 2, Facility Operating License Nos NPF-37 and NPF-66, NRC Docket Nos. STN 50-454 and STN 50-455, Request for Exemption from the Provisions of 10 CFR 50.44, 10 CFR 50.46 and 10 CFR 50 Appendix K for One Lead Test Assembly; and Request for an Increase in the Rod-Average Burnup Limit for Four Fuel Assemblies," for information in support of Byron Station, Units 1 & 2 exemption request to the cladding material specified in 10 CFR 50.44, 10 CFR 50 46 and 10 CFR 50 Appendix K and the request for an increase in the rod-average burnup limit for four assemblies submittal to the Commission, transmitted via Exelon Generation Company, LLC for Byron Station, Units 1 and 2 letter and Application for Withholding Proprietary Information from Public Disclosure, H. A. Sepp, Westinghouse, Manager Regulatory and Licensing Engineering to the attention of J. S Wermiel, Chief, Reactor Systems Branch, Division of Systems Safety and Analysis The proprietary information provides the technical assessment for the exemption request.

This information is part of that which will enable Westinghouse to

(a) Provide technical assessment for the exemption request.

(b) Assist customers to obtain license changes

Further this information has substantial commercial value as follows.

(a) Westinghouse can use this information to further enhance their licensing position with their competitors.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended for developing the enclosed improved core thermal performance methodology.

Further the deponent sayeth not

Proprietary Information Notice

Transmitted herewith are proprietary and non-proprietary versions of documents furnished to the NRC. In order to conform to the requirements of 10 CFR 2 790 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.790(b)(1).

Copyright Notice

The documents transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies for the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2 790 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection not withstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond these necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary

ATTACHMENT 1

Westinghouse Non-Proprietary Class 3

Request for Exemption from the Provisions of 10 CFR 50.44, 10 CFR 50.46 and 10 CFR 50 Appendix K For Replacement Fuel Rods in One Lead Test Assembly (LTA) with Supporting Justification

Byron Station
Unit 1
December 2002

[Proprietary information is enclosed in brackets]

Purpose

Exelon Generation Company, LLC (EGC), with Westinghouse support, is providing justification for an exemption request related to the use of [ ] [a,c] "lower tin" ZIRLO™ clad replacement fuel rods in one Lead Test Assembly (LTA) (i.e., LTA M09E) 10 CFR 50 44, "Standards for combustible gas control system in light-water-cooled power reactor," and 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," specifically refer to fuel with Zircaloy or ZIRLO cladding, and paragraph I.A.5 of 10 CFR 50 Appendix K, "ECCS Evaluation Models," references an analysis which utilizes the Baker-Just equation which assumes the use of a zirconium alloy different than "lower tin" ZIRLO™ used in the replacement rods. Therefore, 10 CFR 50.44, 10 CFR 50 46, and 10 CFR 50 Appendix K do not specifically apply to the proposed replacement rods since the composition of tin in the replacement rods will be nominally [ ] [a,c] which is below the lower bound licensed limit (i.e., 0 80%) of ZIRLO™ as specified in Appendix A of Westinghouse Topical Report, WCAP-12610-P-A, "VANTAGE + Fuel Assembly Reference Core Report," dated April 1995 (i.e , Reference 2). This LTA originally received NRC approval for use of low tin ZIRLO™ that had a nominal tin value of [ ] [a,c] in Reference 1. LTA M09E is scheduled to be inserted into the Byron Station Unit 1 Cycle 13 (i.e., B1C13) core that will begin operation in October 2003. This exemption is requested only for B1C13.

For clarity, the low tin ZIRLO™ clad fuel rods with a nominal tin content of [ ] [a,c], will be referred to as ZIRLO™ (LT-1) since it came from Lot 1 of the low tin ZIRLO™ material The lower tin ZIRLO™ clad fuel rods with a nominal tin content of [ ] [a,c], will be referred to as ZIRLO™ (LT-2) since it came from Lot 2 of the low tin ZIRLO™ material

Background

As the nuclear industry pursues longer operating cycles with increased fuel discharge burnups and more aggressive fuel management, the corrosion performance requirements for the nuclear fuel cladding becomes more demanding. Available industry data from the American Nuclear Society, the International Atomic Energy Agency, the Electric Power Research Institute and Westinghouse indicate that corrosion resistance improves for cladding with a lower tin content The optimum tin level provides a reduced corrosion rate while maintaining the benefits of mechanical strengthening and resistance to accelerated corrosion from abnormal chemistry conditions. In addition, fuel rod internal pressures (resulting from the increased fuel duty, use of Integral Fuel Burnable Absorbers (IFBAs) and corrosion/temperature feedback effects) have become more limiting with respect to fuel rod design criteria. By reducing the associated corrosion buildup and thus minimizing temperature feedback effects, additional margin to fuel rod internal pressure design criteria is obtained.

To meet these needs, Westinghouse Electric Company developed a LTA program in cooperation with EGC. This LTA program incorporated three distinct features 1) ZIRLO™ (LT-1) (i e., tin composition below the currently licensed range for ZIRLO™), [

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] [a,c]. Two LTAs (i.e., M09E and M12E) with these attributes, previously received NRC approval for an exemption from 10 CFR 50.44, 10 CFR 50.46, and 10 CFR 50 Appendix K in Reference 1. These two LTAs have resided in the Byron Station units for a total of two cycles [ ] [a,c] ZIRLO™ (LT-1) fuel rods were pulled from LTA M09E at the end of the first cycle and conventional twice-burned ZIRLO™ replacement fuel rods were inserted to obtain high burnup data. The request to obtain high burnup data was approved by the NRC in Reference 3. Similarly, it is planned that a number of fuel rods ([ ] [a,c]) will be pulled from LTA M09E after B2C10 and replacement fuel rods inserted. The replacement fuel rods will be lower tin ZIRLO™ clad fuel rods whose target tin content will be slightly lower than the previous exemption request, i.e., these replacement rods will be ZIRLO™ (LT-2) clad fuel rods As part of this development program, EGC and Westinghouse plan to reinsert both LTAs, one containing the [ ] [a,c] ZIRLO™ (LT-2) replacement fuel rods, into the B1C13 core in less than limiting core locations The LTAs will provide additional information on ZIRLO™ (LT-1) corrosion behavior and the overall assembly will provide high burnup data that is vital to demonstrating that the fuel performance models can accurately predict high burnup fuel behavior. B1C13 is currently scheduled to begin operation in October 2003. The Byron Station LTAs will be identical to the current 17x17 VANTAGE + fuel assemblies utilized by EGC with the exception of those features mentioned above. This exemption request applies specifically to the use of ZIRLO™ (LT-2) replacement fuel rods.

Byron Station Technical Specifications Section 4.2.1, "Fuel Assemblies," specifies that each fuel assembly shall consist of a matrix of Zircaloy or ZIRLO™. Since the ZIRLO™ cladding material on the replacement fuel rods will have low tin composition (i e., ZIRLO™ (LT-2)) below that currently licensed in WCAP-12610-P-A, exemptions from 10 CFR 50.44, 10 CFR 50.46, and 10 CFR 50 Appendix K are required for these replacement fuel rods It has been determined by Westinghouse that the fuel rods with the reduced tin content will be in sufficiently non-limiting core locations that they are not be expected to achieve high enough temperatures to cause phase change or cladding burst in the event of a Loss of Coolant Accident (LOCA). Therefore, the current Emergency Core Cooling System (ECCS) model and Analysis of Record for Byron Station Units 1 and 2 remain applicable and unchanged. Westinghouse has reviewed, in its development program, the details of the LTA fuel features and their associated impacts on the safety analyses. This review demonstrated the acceptability of the LTA. The Improved Technical Specifications specifically allow the use of LTAs, thus no Technical Specification changes are required for the use of the LTA with ZIRLO™ (LT-2) replacement fuel rods.

Technical Justification for Acceptability of ZIRLO™ (LT-2)

EGC and Westinghouse jointly performed evaluations of the LTAs during the development program phase. These evaluations included both testing and analyses and addressed all aspects of safety, including mechanical, neutronic, thermal-hydraulic, transient, and LOCA accident analyses. These evaluations covered all three design feature changes for the LTAs. However, for this exemption request, the one key feature will be the ZIRLO™ (LT-2) cladding on the replacement fuel rods that will be inserted into LTA M09E. Those properties pertinent to ZIRLO™ (LT-2), for which this exemption request applies, are summarized below.

A. Mechanical evaluations of the LTA, with respect to criteria that govern acceptability considering its mechanical design, have been performed. The same design methods utilized for the current VANTAGE + fuel were used. No new or altered design limits for purposes of satisfying 10 CFR 50, Appendix A, General Design Criterion (GDC) 10, "Reactor Design," need to be applied or are required for this program A fuel rod design evaluation has been performed for the original fuel rods in the LTA. The results of this evaluation showed that all fuel rod design criteria (i e., the Specified Acceptable Fuel Design Limits as required by GDC 10) will be met. An evaluation performed for the ZIRLO™ (LT-2) shows that ZIRLO™ (LT-2) replacement fuel rods are bounded by the previous analysis With respect to the mechanical evaluations, inclusive of material properties, three

specific areas would be potentially impacted by the ZIRLO™ (LT-2) replacement rods. These areas are 1) material properties, 2) corrosion, and 3) thermal creep.

1. Material Properties: [

]a, b, c.

2. Corrosion [

]a, b, c.

3. Thermal Creep. [

] [a, b, c]. This design criteria will be confirmed in the B1C13 specific reload safety evaluation.

B. EGC and Westinghouse have performed nuclear design evaluations of the two original LTAs with respect to impacts on the nuclear design. The standard reload methodologies approved by the NRC (in WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology" and NFSR-0081, "Benchmark of PWR Nuclear Design Methods Using PHOENIX-P and ANC Computer Codes") can be used to model the LTA with the replacement fuel rods This evaluation will be completed prior to insertion of LTA M09E as part of the B1C13 specific reload safety evaluation The features of the LTA and the replacement fuel rods do not challenge the validity of the standard methodologies. EGC will use the standard reload methodologies for the Byron Station reload design containing the LTA with the replacement fuel rods and will assure this LTA is not placed in the highest rod power density locations

C. Thermal-hydraulic design evaluation of the two original LTAs were performed by Westinghouse using their approved methods and information on the characteristics of the core internals and the resident fuel Evaluations performed accounted for the LTAs' impact on minimum Departure from Nucleate Boiling Ratio (DNBR), pressure drop, and fuel assembly lift and lateral flow velocities As expected, the resident fuel Analysis of Record bounded the DNBR performance for the LTAs. The proposed changes in LTA M09E are applied within the geometric envelope of the resident fuel. With no change to the grids, bottom nozzle, top nozzle or guide thimble tube design, or external fuel rod dimension, the LTA with the replacement fuel rods represents no change to the hydraulic performance as compared to the resident fuel The LTA has equivalent assembly and component hydraulic characteristics (e.g., pressure drop) as that of the resident fuel. The enrichment of the ZIRLO™ (LT-2) replacement fuel rods will be reduced to match the reactivity of the remaining fuel rods, thus ensuring that the ZIRLO™ (LT-2) replacement fuel rods are not the lead rods in the core or in the assemblies. This ensures that use of the LTA has no impact on thermal hydraulic evaluations and safety limits associated with the fuel design. This conclusion will be confirmed in the reload specific thermal-hydraulic evaluation for B1C13.

D. A LOCA safety analysis evaluation for the two original LTAs was performed by Westinghouse using the then-current Byron Station ECCS Model Safety Analysis of Record, as noted in a letter from R. M. Krich (Commonwealth Edison Company) to U.S Nuclear Regulatory Commission, "Revision to Report Submitted Under 10 CFR 50 46," dated July 30, 1998. The features of the LTAs were evaluated for effect on the LOCA analyses This included consideration of fuel pellet temperature, fuel pellet density and mass, fuel rod internal pressure, pellet thermal conductivity, and cladding thermo-mechanical properties The cladding thermo-mechanical property review included the high temperature creep model, burst temperature and burst strain models, oxidation rate, and specific heat. As stated previously, for Cycle 13 the fuel rods with the reduced tin content (i.e., ZIRLO™ (LT-1) and ZIRLO™ (LT-2)) will be sufficiently non-limiting such that they

would not be expected to achieve high enough temperatures to cause phase change or cladding burst in the event of a LOCA The current ECCS Analysis of Record covers Zircaloy-4 and current ZIRLO™ clad fuel. Since the fuel rods with reduced tin content (i.e., ZIRLO™ (LT-1) and ZIRLO™ (LT-2)) will have low reactivity, the current Analysis of Record will remain bounding for the LTA with the replacement fuel rods and all 10 CFR 50 46 Acceptance Criteria will continue to be met This conclusion will be confirmed in the reload specific LOCA evaluation for B1C13.

E. Non-LOCA transient safety analysis evaluations were performed by Westinghouse to assess the impact of the LTAs on all the Updated Final Safety Analysis Report, Chapter 15 non-LOCA accident analyses Westinghouse used NRC approved methodology to assess LTA design features that could impact the Safety Analyses of Record Since the LTA with the ZIRLO™ (LT-2) replacement fuel rods is geometrically identical to the current resident fuel and there is no significant change to the ZIRLO™ material properties, and because the LTA with the ZIRLO™ (LT-2) replacement fuel rods will not be placed in the highest rod power density locations, it will be bounded by the current transient Safety Analyses of Record performed for the resident fuel. This conclusion will be confirmed in the reload specific non-LOCA evaluation for B1C13.

Justification of Exemption in Accordance with 10 CFR 50.12

10 CFR 50.12, "Specific exemptions," states that the NRC may grant exemptions from the requirements of the regulations of this part provided:

1. the exemption is authorized by law;
2. the exemption will not present an undue risk to the public health and safety;
3. the exemption is consistent with the common defense and security; and
4. special circumstances are present.

1 The exemption is authorized by law.

LTA programs and irradiation of new materials are not precluded by law The requirements of 10 CFR 50.44, 10 CFR 50.46 and 10 CFR 50, Appendix K may be deviated from when an exemption is granted by the NRC in accordance with 10 CFR 50 12. [ ]^{a,c} of the fuel rods in one LTA, to be irradiated in B1C13, contains cladding materials that do not conform to the cladding material specified in 10 CFR 50.44 and 10 CFR 50.46 (i.e., Zircaloy or ZIRLO™). The standards and acceptance criteria of these sections will however continue to be satisfied. Similarly, 10 CFR 50, Appendix K references an analysis which utilizes the Baker-Just equation which assumed use of a zirconium alloy different than the "lower tin" ZIRLO™ alloy used in the subject LTA; however, the Baker-Just equation has been determined to be appropriate for evaluation of the lower tin ZIRLO™ (LT-2).

2. The exemption will not present an undue risk to the public health and safety.

The Westinghouse LTA safety evaluation demonstrated that all aspects of safety, including mechanical, thermal hydraulic, neutronic, and non-LOCA transient analyses results were within those approved for the current 17x17 VANTAGE + fuel assemblies utilized by EGC in Byron Station, Units 1 and 2 Cycle specific evaluations, in accordance with NRC approved methodology, (i e., WCAP-9272-P-A), are expected to demonstrate that the LOCA evaluation results for the LTA with the replacement fuel rods are within those approved for the current 17x17 VANTAGE + fuel assemblies utilized by EGC in Byron Station, Units 1 and 2. The LTA with the replacement fuel rods will be placed in a non-limiting core location that does not experience the highest core power density throughout this cycle of operation Therefore, the use of the LTA will not present an undue risk to the public health and safety.

3. The exemption is consistent with the common defense and security.

The LTA is similar in design to standard reload fuel assemblies used in B1C13 The special nuclear material in these assemblies will continue to be handled and controlled in accordance with approved procedures. Use of the LTA in B1C13 will not affect plant operations and is consistent with the common defense and security.

4 This request for an exemption involves special circumstances as set forth in 10 CFR 50.12(a)(2)(ii)

10 CFR 50.12(a)(2) states that the NRC will not consider granting an exemption to the regulations unless special circumstances are present The requested exemption meets the special circumstances of 10 CFR 50.12(a)(2)(ii) which states that, "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule." In this particular circumstance, application of the subject regulations is not necessary to achieve the underlying purpose of the regulations

The underlying purpose of 10 CFR 50 44 is to ensure that there is an adequate means of controlling generated hydrogen The hydrogen produced in a post-LOCA scenario comes from a metal-water reaction Oxidation tests performed by Westinghouse on the ZIRLO™ (LT-1 and LT-2) alloy have demonstrated that the reduction in tin content has an [ ]^{a,c} versus current ZIRLO™. Therefore, the use of ZIRLO™ (LT-2) replacement fuel rods will also have no significant effect on current assessments of hydrogen gas production

10 CFR 50.46 identifies acceptance criteria for ECCS performance at nuclear power plants. The effectiveness of the ECCS in Byron Station will not be affected by the insertion of the LTA with the replacement fuel rods. Due to the similarities in the material properties of the ZIRLO™ (LT-1), ZIRLO™ (LT-2) and current ZIRLO™, the current ECCS model remains applicable and unchanged. In addition, the location of the LTA with the ZIRLO™ (LT-2) replacement fuel rods will be in a non-limiting core location Therefore, it can be concluded that the ECCS performance of Byron Station will not be adversely affected.

The intent of 10 CFR 50, Appendix K, paragraph I A 5 is to apply an equation for rates of energy release, hydrogen generation, and cladding oxidation from a metal-water reaction that conservatively bounds all post-LOCA scenarios. Application of the Baker-Just equation has been demonstrated to be appropriate for the ZIRLO™ (LT-2) alloy.

Environmental Assessment

In accordance with 10 CFR 51 30, "Environmental assessment," and 10 CFR 51 32, "Finding of no significant impact," the following information is provided in support of an environmental assessment and finding of no significant impact for the proposed action.

Identification of the Proposed Action

The proposed action would exempt Byron Station, Unit 1 from the requirements of 10 CFR 50 44, "Standards for combustible gas control system in light-water-cooled power reactor," 10 CFR 50 46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," and 10 CFR 50 Appendix K, "ECCS Evaluation Models," to allow use of a lead test assembly (LTA) with a limited number of replacement fuel rods with ZIRLO cladding that has a tin content lower than the currently licensed tin content range for ZIRLO.

Need for Proposed Action

As the nuclear industry pursues longer operating cycles with increased fuel discharge burnups and more aggressive fuel management, the corrosion performance requirements for the nuclear fuel cladding becomes more demanding Available industry data from the American Nuclear Society, the International Atomic Energy Agency, the Electric Power Research Institute and Westinghouse indicate that corrosion resistance improves for cladding with a lower tin content The optimum tin level provides a reduced corrosion rate while maintaining the benefits of mechanical strengthening and resistance to accelerated corrosion from abnormal chemistry conditions. In addition, fuel rod internal pressures resulting from the increased fuel duty, use of Integral Fuel Burnable Absorbers and corrosion/temperature feedback effects have become more limiting with respect to fuel rod design criteria. By reducing the associated corrosion buildup and thus minimizing temperature feedback effects, additional margin to fuel rod internal pressure design criteria is obtained.

As part of a program to address these issues, Westinghouse Electric Company, LLC (Westinghouse) has developed an LTA program in cooperation with Exelon Generation Company, LLC (EGC) which includes ZIRLO fuel cladding with a tin content lower than the currently licensed range for ZIRLO. 10 CFR 50 44, 10 CFR 50.46 and 10 CFR Part 50, Appendix K, make no provisions for use of fuel rods clad in a material other than Zircaloy or ZIRLO; therefore, we are requesting the use of an LTA with a tin composition that is less than the licensing basis for ZIRLO, as defined in Westinghouse design specifications Use of this LTA requires exemptions from 10 CFR 50 44, 10 CFR 50 46 and 10 CFR Part 50. As part of this program, EGC and Westinghouse propose to use the subject LTA in the Byron Station, Unit 1, Cycle 13 core in a non-limiting core location currently scheduled to begin in October 2003

Environmental Impacts of the Proposed Action

The proposed action (i.e., granting the exemption) will not increase the probability or consequences of accidents previously analyzed, no changes are being made in the types or quantities of any radiological effluents that may be released offsite, and there is no significant increase in occupational or public radiation exposure. Therefore, there are no significant radiological environmental impacts associated with the proposed action.

The proposed action does not affect non-radiological plant effluents and has no other environmental impact Therefore, there are no significant non-radiological impacts associated with the proposed action

Alternatives to the Proposed Action

The principal alternative to the proposed action would be to deny the requested exemption and require adherence to the requirements of 10 CFR 50.44, 10 CFR 50.46 and 10 CFR Part 50, Appendix K. Denial of the exemption request would result in no change in environmental impacts The environmental impacts of the proposed action and the alternative action are similar. Based on the assessment above, the proposed action will not have a significant effect on the quality of the human environment

Alternative use of Resources

Granting the requested exemption will not involve the use of resources not previously considered in the Final Environmental Statements for Byron Station and Braidwood Station, (i e , NUREG-0848, "Final Environmental Statement related to the operation of Byron Station, Units 1 and 2," dated April 1982 and NUREG-1026, "Final Environmental Statement related to the operation of Braidwood Station, Units 1 and 2," dated June 1984)

Conclusion

10 CFR 50 44 and 10 CFR 50 46 only apply to the use of fuel rods clad with Zircaloy or ZIRLO™. 10 CFR 50 44 and 10 CFR 50 46 do not apply to the use of the proposed ZIRLO™ (LT-2) replacement fuel rods in LTA M09E since the composition of tin in these rods will be nominally [ ] [a,c] which is below the lower bound of the licensing basis for ZIRLO™, as defined in WCAP-12610-P-A, which specifies the tin composition as being between 0.80% and 1.20%. In addition, paragraph I.A.5 of 10 CFR 50 Appendix K, "ECCS Evaluation Models," references an analysis which utilizes the Baker-Just equation which assumed use of a zirconium alloy different than "lower tin" ZIRLO™ (LT-2) used in the replacement rods.

In order to support enhancements of the ZIRLO™ material with improved corrosion resistance, an exemption from the requirements of 10 CFR 50 44, 10 CFR 50.46 and 10 CFR 50 Appendix K is requested Testing and evaluations demonstrate that the intent of the regulations continue to be met since all aspects of safety, including mechanical, neutronic, thermal hydraulic, transient, and LOCA accident analyses results fall within those approved for the current 17x17 VANTAGE + fuel assemblies Analyses of Record for Byron Station, Units 1 and 2. Therefore, granting approval of this exemption request does not violate the underlying purpose of the rule and special circumstances exist to justify the approval of an exemption from the subject requirements

EGC respectfully requests that the NRC approve this exemption request by August 1, 2003, in order to support B1C13 operations scheduled to being in October 2003

References

1. Letter from Mr. J. B. Hickman (NRC) to Mr. O. D. Kingsley, (Commonwealth Edison Company), "Issuance of Exemption from the Requirements of 10 CFR 50.44, 10 CFR 50 46, and 10 CFR Part 50, Appendix K – Byron Station, Units 1 and 2 (TAC Nos. MA3930 and MA3931)," February 26, 1999

2. Davidson, S. L. and Nuhfer, D. L (Eds.), "VANTAGE + Fuel Assembly Reference Core Report," WCAP-12610-P-A, April 1995

3. Letter from NRC to John L Skolds (Exelon Generation Company, LLC), "Byron Station, Units 1 and 2, and Braidwood, Station Units 1 and 2 – Issuance of Amendments (TAC NOS. MB3013, MB3014, MB3011, and MB3012)," dated April 19, 2002

4. Superscripts a, b, and c refer to Affidavit paragraphs 4(ii)(a), 4(ii)(b), 4(ii)(c)

ATTACHMENT 2

Westinghouse Non-Proprietary Class 3

Request for Approval of Fuel Rod Burnup Beyond the Current Licensing Basis

Byron Station
Unit 1
December 2002

[Proprietary information is enclosed in brackets]

Purpose

Exelon Generation Company, LLC (EGC) is requesting NRC approval to irradiate two Lead Test Assemblies (LTAs) (i.e., M09E and M12E) and two "standard" Westinghouse 17x17 VANTAGE+ ZIRLO™ assemblies (i.e., M10E and M11E) beyond the current fuel rod-average licensing basis burnup value of 60,000 megawatt-days per metric tonne Uranium (MWD/MTU) up to 69,000 MWD/MTU during Byron Station Unit 1 Cycle 13 (i.e., B1C13). Irradiation of these four assemblies is intended to confirm the acceptable use of the ZIRLO™ alloy to a discharge burnup level exceeding the current licensing basis The projected fuel rod-average burnup of all four assemblies at the end of B1C13 will be approximately 67,000 MWD/MTU (69,000 MWD/MTU including margin for potential coast down)

Fuel Rod Burnup Licensing Basis

There is no Technical Specification (TS) which imposes a limit on fuel rod burnup; however, Byron and Braidwood Stations have a licensing basis commitment that limits the current fuel rod-average burnup to ≤ 60,000 MWD/MTU. This licensing basis commitment is documented in the NRC Safety Evaluation supporting Amendments 78 and 70 for Byron and Braidwood Stations respectively, dated December 19, 1995. These amendments approved the use of ZIRLO™ fuel cladding.

The basis for approval of ZIRLO™ cladding was based on an NRC Safety Evaluation addressed to Westinghouse, "Acceptance for Referencing of Topical Report WCAP-12610, 'VANTAGE+ Fuel Assembly Reference Core Report,'" dated July 1, 1991 This Safety Evaluation approved the use of the VANTAGE+ fuel design, i.e., ZIRLO™ clad fuel, described in WCAP-12610-P-A and found it acceptable up to a rod-average burnup of 60,000 MWD/MTU. The Safety Evaluation notes that WCAP-12610-P-A supports the following conclusions.

1. The mechanical design bases and limits for the ZIRLO™ clad fuel assembly design are the same as those for the previously licensed Zircaloy-4 clad fuel assembly design, except those for clad corrosion.

2. The neutronic evaluations have shown that the ZIRLO™ clad fuel nuclear design bases are satisfied and that key safety parameter limits are applicable. The nuclear design models and methods accurately describe the behavior of ZIRLO™ clad fuel.

3. The thermal and hydraulic design basis for the ZIRLO™ clad fuel is unchanged.

4 The methods and computer codes used in the analysis of the non-loss of coolant accident (LOCA) licensing basis events are valid for ZIRLO™ clad fuel and all licensing basis criteria will be met.

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5. The large break LOCA evaluation model was modified to reflect the behavior of the ZIRLO™ clad material during a LOCA. It is concluded that the revised evaluation model satisfies the requirements of 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," and 10 CFR 50, Appendix K, "ECCS Evaluation Models " There is no significant impact on typical large break LOCA analysis results for the ZIRLO™ model revision.

Fuel Assembly History and Composition

Lead Test Assemblies

During Byron Station, Unit 1 Cycle 10 (i e., B1C10) operation, two LTAs (i.e., M09E and M12E) were utilized consistent with TS 4.2 1, "Fuel Assemblies." The LTAs are designed with Westinghouse 17x17 VANTAGE+ features, LTA features (i e., spring clip, low tin ZIRLO™ cladding, and higher density fuel pellets), and have ZIRLO™ guide thimbles and mixing vane mid-grids, and a debris resistant bottom nozzle. [ ]^{a,c} fuel rods in each assembly are composed of low tin ZIRLO™ (LT-1) cladding; the remaining rods in each LTA have standard ZIRLO™ cladding. M09E also has a removable top nozzle.

For Byron Station, Unit 2 Cycle 10 (i.e., B2C10) operation, these two LTAs were again utilized, however, one of the LTAs (i.e , assembly M09E) was modified to also include high burnup fuel rods. Four rods from LTA M09E were removed after B1C10 and replaced with previously burned ZIRLO™ rods from assembly L41E for the purpose of obtaining representative data at extended fuel burnup (i.e., > 60,000 MWD/MTU) The four high burnup donor fuel rods were "twice-burned" (i.e., used for two fuel cycles) in assembly L41E and had rod-average burnups of approximately 45,750 MWD/MTU at the start of B2C10. Approval to irradiate the four high burnup rods up to 69,000 MWD/MTU was granted in Reference 3.

At the end of B2C10, the [ ]^{a,c} will be removed from LTA M09E and replaced with "lower tin" ZIRLO™ (LT-2) fuel rods. No fuel rods will be replaced in LTA M12E The approximate assembly average burnup for each of these two LTAs at the end of B2C10 is given below.

LTA M09E. 51094 MWD/MTU
LTA M12E: 51123 MWD/MTU

Westinghouse 17x17 VANTAGE+ ZIRLO™ Assemblies

The two "regular" assemblies (i e., M10E and M11E) are standard Westinghouse 17x17 VANTAGE+ ZIRLO™ assemblies These two assemblies have been irradiated for two cycles The assembly average burnup for each of these two standard assemblies at the end of B2C10 is given below.

M10E: 51457 MWD/MTU
M11E: 51423 MWD/MTU

Technical Justification for Extending Fuel Rod Burnup Limit

The peak rod-average burnup for any of the regular ZIRLO™ and ZIRLO™ (LT-1) clad fuel rods to be used in B1C13 is projected to be approximately 67,000 MWD/MTU. This burnup will exceed the current licensing basis limit of 60 GWD/MTU for peak fuel rod-average burnup, therefore, it is requested that the NRC provide approval to increase the peak rod-average burnup limit for the above four fuel assemblies from 60,000 MWD/MTU to

69,000 MWD/MTU for B1C13. Approval for up to 69,000 MWD/MTU burnup is being requested to ensure sufficient margin exists in the event the fuel cycle is extended due to coast down. Fuel rod design criteria that become more limiting for high burnup fuel rods include fuel rod growth, clad fatigue, rod internal pressure and cladding corrosion Evaluations have been performed using NRC-approved fuel rod design methodologies. These models have been used to perform similar evaluations for other high burnup LTAs In addition, a developmental corrosion model for ZIRLO™ will be used as an evaluation tool based primarily on data from high burnup fuel irradiated at the V. C. Summer and North Anna plants and accounts for observed corrosion from the ZIRLO™ (LT-1) clad fuel rods that were examined in previous post-irradiation examination (PIE) campaigns. Both the ZIRLO™ developmental corrosion model and the NRC-approved model will be used in the B1C13 specific reload safety evaluation to confirm that the fuel rod design limits will be met

The regular ZIRLO™ and ZIRLO™ (LT-1) high burnup fuel rods will continue to satisfy the Specified Acceptable Fuel Design Limits (SAFDLs) specified in the Westinghouse Topical Report, WCAP-12488-A, "Westinghouse Fuel Criteria Evaluation Process", (i.e , Reference 1) This report was approved by the NRC on July 27, 1994. The clad integrity of the ZIRLO™ and ZIRLO™ (LT-1) high burnup rods will be maintained as the subject fuel assemblies will be placed in less than limiting core locations and will continue to meet the safety parameter requirements In addition, the acceptability of using the ZIRLO™ and ZIRLO™ (LT-1) high burnup rods will be evaluated in the B1C13 Reload Safety Evaluation which will be supplemented by a Westinghouse LTA Report.

It has been shown in WCAP-12610-P-A, (i.e., Reference 2), that even though there are variations in core inventories of isotopes due to extended burnup up to 75,000 MWD/MTU, there are no significant increases of isotopes that are major contributors to accident doses It is worthy to note that, at higher burnups, there is actually a reduction in certain isotopes that are major dose contributors under accident situations (e.g., Kr-88) With only a limited number of ZIRLO™ and ZIRLO™ (LT-1) high burnup rods in the entire core, any variation of isotopes will be extremely small. Thus, the radiation dose limitations of 10 CFR 100, "Reactor Site Criteria," will not be exceeded

Specifically, regarding the ZIRLO™ (LT-1) high burnup rods, since the two original LTAs only had [ ]^{a,c} ZIRLO™ (LT-1) clad rods each, even if none of the ZIRLO™ (LT-1) clad rods had been pulled from LTA M09E, this limited number of fuel rods taken to higher burnup would not result in a safety concern. The rationale for this statement is based on: 1) the assembly will retain a coolable geometry, and 2) the plant dose criterion will not be exceeded or approached in the event that any of the ZIRLO™ (LT-1) clad fuel rods leaked. These conclusions are based on prior Westinghouse bounding calculations. In order to substantiate the materials performance behavior, this data is vital to obtain, not just for current burnup levels but for possible future high burnup licensing needs

Conclusion

EGC is proposing to insert four assemblies into non-limiting core locations during B1C13 for the purpose of obtaining high burnup data. Two of the assemblies are "standard" Westinghouse 17x17 VANTAGE+ ZIRLO™ fuel assemblies; the other two assemblies are LTAs that contain both ZIRLO™ and low tin ZIRLO™ (LT-1) rods. Note that one of the LTAs (i.e., M09E) also contains [ ]^{a,c} lower tin ZIRLO™ (LT-2) rods; however, these rods are fresh fuel rods and will not experience high burnup during B1C13. The projected burnup for these four assemblies at the end of Cycle 13 will be approximately 67,000 MWD/MTU Based on the above analysis, extending the peak rod-average burnup limit to 69,000 MWD/MTU will not create a safety concern, as all fuel design limits will continue to be met

EGC respectfully requests that the NRC approve this request for extended burnup by August 1, 2003 in order to support B1C13 operations scheduled to being in October 2003.

References

1. Davidson, S L , (Ed), et al., "Westinghouse Fuel Criteria Evaluation Process," WCAP-12488-A, October 1994

2. Davidson, S L. and Nuhfer, D. L. (Eds), "VANTAGE + Fuel Assembly Reference Core Report," WCAP-12610-P-A, April 1995

3 Letter from NRC to John L. Skolds (Exelon Generation Company, LLC), "Byron Station, Units 1 and 2, and Braidwood, Station Units 1 and 2 – Issuance of Amendments (TAC NOS. MB3013, MB3014, MB3011, and MB3012)," dated April 19, 2002

4. Superscripts a, b, and c refer to Affidavit paragraphs 4(ii)(a), 4(ii)(b), 4(ii)(c)