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March 11, 1985

United States Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Mr. Hugh L. Thompson, Jr., Director
Division of Licensing
Office of Nuclear Reactor Regulation

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
GNLR 84-08 Appeal Meeting Request and Position Statement on the
Issue of Probable Maximum Precipitation

REFERENCES: 1) NRC letter (G. W. Knighton to E. J. Woolever) dated January
10, 1985
2) NRC letter (T. M. Novak to E. J. Woolever) dated November 6,
1984
3) DLC letter 2NRC-4-195, dated November 20, 1984

Gentlemen:

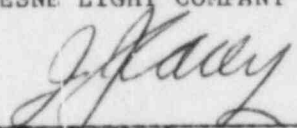
This letter is in response to the NRC letter dated January 10, 1985 (Reference 1). In that letter, the NRC staff amplified on the backfit issue relating to Probable Maximum Precipitation (PMP). The previous staff position was provided in a November 6, 1984, NRC letter (Reference 2). The Duquesne Light Company (DLC) response to the November 6 letter was provided by DLC letter dated November 20, 1984 (Reference 3).

DLC proposes that the first appeal of this issue be scheduled during the week of March 25-29, 1985.

The NRR procedure for management of plant specific backfitting specifies that the appeal meeting agenda be developed from the staff and licensing positions and be distributed prior to any meeting. An outline of DLC's position on this issue is attached to facilitate the Project Manager's development of such.

DUQUESNE LIGHT COMPANY

By


E. J. Woolever
Vice President

RW/wjs
Attachment

cc: Mr. S. Chesnut, Technical Assistant - w/attachment
Mr. M. Clausen, Technical Assistant - w/attachment
Mr. H. Denton, Director NRR - w/attachment
Mr. T. Novak, Assistant Director - w/attachment
Mr. B. K. Singh, Project Manager - w/attachment
Mr. V. Stello, DEDROGER - w/attachment
Mr. J. Tourtellotte, Chairman RRTF - w/attachment
Mr. G. Walton, NRC Resident Inspector - w/attachment

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ISSUE: Review Criteria for Probable Maximum Precipitation (PMP)BACKFIT ISSUE NO.: L-84-16DLC BACKFIT NO.: 1

<u>05/30/84</u>	<u>01/10/85</u>	<u>03/11/85</u>	<u>03/11/85</u>	<u>Meeting</u>	<u>First</u>	<u>Minutes &</u>	<u>Second</u>	<u>Meeting</u>	<u>Second</u>	<u>Minutes &</u>	<u>Formal</u>
<u>Backfit</u>	<u>NRC Rqmnts</u>	<u>Appeal</u>	<u>Position</u>	<u>Agenda</u>	<u>Appeal</u>	<u>Decision</u>	<u>Appeal</u>	<u>Agenda</u>	<u>Appeal</u>	<u>Decision</u>	<u>Appeal</u>
<u>Identified</u>	<u>Letter</u>	<u>Filed</u>	<u>Statement</u>	<u>Submitted</u>	<u>Meeting</u>	<u>Issued</u>	<u>Requested</u>	<u>Issued</u>	<u>Meeting</u>	<u>Issued</u>	<u>Request to</u>
											<u>Dir, NRR</u>

	NRC POSITION	DLC POSITION	COMMENTS
PROPOSED REQUIREMENTS	<p>General Design Criterion 2 (GDC-2), "Design bases for protection against natural phenomena," of 10 CFR 50, Appendix A, requires, in part, that nuclear power plant structures, systems and components be designed to withstand the effects of floods without loss of capability to perform their safety functions.</p> <p>Guidance is also contained in Regulatory Guides 1.55, "Design Basis Floods for Nuclear Power Plants", and 1.102, "Flood Protection for Nuclear Power Plants". These documents state that the appropriate design basis for precipitation induced flooding is the Probable Maximum Flood (PMF) as developed by the Corps of Engineers. This PM criterion has been used by the staff since at least 1970 for requirements of intense local precipitation. This review was incorporated into the Standard Review Plan (SRP) 2.4.2 and 2.4.3.</p> <p>SRP 2.4.2 refers to SRP Section 2.4.3 for PMP estimates, time distribution, etc.</p> <p>SRP 2.4.3 states the following:</p> <p>Section V. REFERENCES</p> <p>"In addition to the following specific references, Design Memoranda, Civil Works Investigations and research and development reports of the Corps of Engineers and reports of other Federal and state agencies relevant to flood estimates at a specific site will be used on an "as-available" basis..."</p> <p>Hydrological Reports (HMR) 51 and 52 were issued jointly by National Oceanic and Atmospheric Administration (National Weather Service) and the U. S. Army Corps of Engineers in June 1978 and August 1982, respectively.</p>	<p>HMR 33 methodology, as suggested by the SRP, was used to demonstrate that BVPS-2 meets GDC 2.</p> <p>BVPS-2 was designed prior to the issuance of HMR 51 and 52.</p> <p>Construction of the BVPS-2 safety related structures reached a significant percentage of completion prior to the issuance of HMR 52.</p> <p>No regulations provide for the use of HMR 51/52 and their use has not been approved by the Commission.</p> <p>No regulations require update of PMP evaluation methodology.</p> <p>HMR 52 was issued after the effective date for CRGR review requirements (November 12, 1981). No guidance/requirement specifying the use of HMR 52 has been approved by CRGR.</p>	

	NRC POSITION	DLC POSITION	COMMENTS
PROPOSED REQUIREMENTS	<p><u>1. PROPOSED REQUIREMENTS</u></p> <p>The NRC position is adequately described in DLC's statement of the NRC position under their discussion of "Relationship of New Requirements to Existing Regulatory Position". That discussion should be transposed in its entirety to this section. The following paragraph should be added to the transposed discussion:</p> <p>The criterion that best meets the requirements of GDC-2 with respect to hydrologic events is the PMP, and HMR 51/52 provide methods for estimating PMP for small drainage areas. Prior to publication of HMR 52, there were no documented qualitative procedures for evaluating PMP for small drainage areas nor for distributing the PMP into short time periods to correspond to these small drainage areas. Because HMR 51/52 provide methods and procedures, not previously available, for estimating PMP for small drainage areas, the staff's position is that HMR 51/52 should be used as a basis for review in accordance with procedures cited in SRP 2.4.2 and 2.4.3.</p> <p><u>NRC COMMENTS</u></p> <p>The staff's review procedures that utilize Probable Maximum Precipitation (PMP) were established to meet General Design Criterion 2 (GDC-2), "design bases for protection against natural phenomena," of 10 CFR 50, Appendix A, which requires in part that nuclear power plant structures, systems and components be designed to withstand the effects of floods without loss of capability to perform their safety functions. The objective is to prevent loss of capability for safe shutdown resulting from the most severe flood conditions that can reasonably be predicted to occur at a site as a result of severe hydrometeorological conditions.</p> <p>In searching for a consistent design criterion for protection against local flooding, the staff adopted the Probable Maximum Flood (PMF) as developed by the Corps of Engineers. This criterion was originally developed to be applied to the design of Federal Structures (principally dams) whose failure by flooding could result in substantial loss of human life or property. The NRC staff adopted this methodology as the design basis for Federally licensed nuclear facilities for similar reasons.</p> <p>Procedures for evaluating PMF have evolved in various Corps of Engineers (COE) and National Weather Service (NWS) publications. Of particular interest for precipitation-induced flooding (Probable Maximum Precipitation, or PMP) are HMR's 33, 51, and 52. HMR 33, published in 1956, provided generalized charts for establishing the level of PMP for specified drainages of the United States east of the 105th meridian. HMR 51, published in 1978, updated HMR 33 by expanding the PMP estimates to a specific range of drainage area sizes and storm durations. HMR 52, published in 1982, provides a stepwise approach for adapting PMP estimates derived from HMR 51 to specific drainage areas.</p> <p>The point to be made from the above discussion is that PMF is the design criterion adopted by the NRC to assure that GDC-2 is met; and the category of PMF resulting from precipitation-induced local flooding requires as input the PMP. The guidelines provided by HMR's 33, 51 and 52 are evolving procedures developed by the COE and NWS to evaluate the PMF for local flooding. The NRC Standard Review Plans, direct the staff to take into consideration improved methodologies in its review process. Such considerations are also included in the industry's own guidelines. Thus, ANSI N170-1976 contained references to HMR-33 and its more recent version, ANSI/ANS 2.8 - 1981, includes reference to HMR-51. HMR-52 was published in 1982 and there have been no updated versions of either NRC or ANSI guides to reflect its existence. Nevertheless, because it represents a refinement of the PMP methodology for small drainages that are typical of nuclear sites, its use is appropriate so long as PMP is the criterion for determining that a facility meets GDC-2.</p>	<p>Note that the staff comments use the term "can reasonably be predicted to occur."</p> <p>The staff comments note that no updates of NRC guidance reflect the existence of HMR-52. Requiring the use of an unreferenced and unapproved HMR is inconsistent with the procedures for incorporation of other codes/standards/industry guidance. NRC adoption/ approval/conditional approval of specific editions of codes/standards/industry guides is usually incorporated into regulations, Regulatory Guides, and/or the SRP.</p> <ol style="list-style-type: none">1. <u>Regulations</u> - 10CFR50.55(a) endorses specific editions of ASME codes.2. <u>Regulatory Guides</u> - RG 1.59 endorses a specific edition of an ANSI standard; ANSI N170-1976.3. <u>Standard Review Plan</u> - SRP 2.4.3 endorses HMR 33, 1956, and EM 1110-2-1141, revision of March, 1965. Although SRP 2.4.3 was issued more than three years after HMR 51, it did not endorse HMR 51.	

ISSUE: Review Criteria for Probable Maximum Precipitation (PMP)BACKFIT ISSUE NO.: L-84-16DLC BACKFIT NO.: 1

	NRC POSITION	DLC POSITION	COMMENTS
PROPOSED REQUIREMENTS	<p><u>DLC POSITION</u></p> <p>The DLC position indicates conflicting guidance by the NRC staff in correspondence dated August 31, 1983, October 12, 1984, and November 8, 1984.</p> <p><u>NRC COMMENTS</u></p> <p>On August 31, 1983, we requested in 11 questions, information to continue our safety review. One of the questions asked that they adjust their site flooding analysis using HMR 51/52. All the other requested information was needed to review the applicant's analysis already in the FSAR. Other than submitting a topographic map, they did not respond to any of the questions addressing site flooding; instead, they made an appeal based on the evaluation request. Since we needed responses to the</p> <p>other questions to continue our FSAR review, we resubmitted our August 31, 1983, questions on October 12, 1984, without the request to adjust their flooding analysis with HMR 51/52. DLC, by letter dated November 8, 1984, provided a response to these questions. The HMR 51/52 requirement was suspended pending resolution of DLC's appeal. The November 6, 1984, letter from NRC merely restated NRC's position on the issues that the applicant wished to appeal.</p> <p><u>DLC COMMENTS</u></p> <p>DLC states that "NRC's acceptance review found the BVP5-2 license application acceptable for docketing with the PMP evaluation based on HMR-33."</p> <p><u>NRC COMMENTS</u></p> <p>The DLC statement is accurate; however, an acceptance review is not and should not be considered to represent a detailed analysis or evaluation. On the contrary, during an acceptance review, the staff reviewers make a rapid survey to determine if the material submitted by the applicant is sufficient to initiate a detailed review. Finding the license application acceptable for docketing should therefore not be construed to imply that calculation methods used by the applicant, such as PMP analysis, are acceptable.</p>	<p>DLC position was previously stated.</p> <p>The acceptance review may not be a detailed analysis/evaluation of each calculation or bit of data. The use of HMR 33 (as suggested by the SRP) is not a minor detail, therefore, it is significant that HMR 33 was considered sufficient to initiate a detailed review.</p>	
SUGGESTED TIME FOR IMPLEMENTATION	<p>IV. <u>ITEM: SUGGESTED TIME FOR IMPLEMENTATION</u></p> <p><u>NRC COMMENTS</u></p> <p>The staff expected the adjusted evaluation of local site flooding in a reasonable time (about 4 months) following the first request for it on August 31, 1983.</p>	<p>The staff implementation date, within four months of August 31, 1983, is not consistent with NRC Manual Chapter 0514 (Paragraph 044) which states, "... staff proposed requirements will not be imposed ... during the appeal process."</p>	

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	NRC POSITION	DLC POSITION	COMMENTS
HOW PROPOSED REQUIREMENT WOULD IMPROVE SAFETY	<p>II. <u>HOW PROPOSED REQUIREMENT WOULD IMPROVE SAFETY</u></p> <p>The NRC position as stated by DLC is adequate.</p> <p><u>DLC POSITION</u></p> <p>DLC states, "The roofs of safety-related structures are designed to support water accumulation at the parapet overflow level. Postulating a greater PMP event results in increased overflow rather than increased accumulation..."</p> <p><u>NRC COMMENTS</u></p> <p>The FSAR contains no information regarding roof design so the staff cannot agree or disagree with the statement. Additional information will be required from the applicant before the staff is able to determine if roofs of safety-related structures are capable of supporting the loads that would be induced by ponded water from a PMP. Additionally, the first statement is not entirely correct because for increased flow over the parapets, the water level has to increase. DLC should provide information to demonstrate that roofs of safety-related structures can support the weight of any additional storage above the level of the parapets.</p> <p><u>DLC POSITION</u></p> <p>DLC further indicates that because HMR 33 describes PMP as being synonymous with "maximum possible precipitation", the HMR 33 PMP has a probability of zero. Therefore, unless the staff can demonstrate that a storm more severe than the HMR 33 PMP has a probability greater than zero, no increase in safety can be demonstrated for the use of a more severe projection.</p> <p><u>NRC COMMENTS</u></p> <p>It is well established that the appropriate design basis for precipitation induced flooding at nuclear plants is the Probable Maximum Flood (PMF). An integral component of PMF determination is PMP. PMP is not an absolute value as suggested by DLC, but represents a best estimate of an upper bound whose value is subject to change as additional data become available and more detailed studies are conducted. The value of PMP given in HMR 33 was the best estimate of PMP in 1956 when HMR 33 was published and the value of PMP determined in HMR 51/52 is the best estimate today.</p> <p><u>DLC POSITION</u></p> <p>In an attempt to show how conservative HMR 33 is, DLC also states that, "The highest actual rainfall for the Pittsburgh area was 2.09 inches in 1 hour (during 1876). The HMR 33 analysis uses a 1 hour intensity of 9.3 inches/hour."</p> <p><u>NRC COMMENTS</u></p> <p>Major storms produce rainfall that varies considerably over the impacted region, which is reflected in different amounts measured by the raingages scattered throughout the region. DLC selected a rainfall record that had a maximum one hour rainfall of 2.09 inches and claims that it is the "highest actual rainfall for the Pittsburgh area." This measurement may be the case for that one gage but it may not be representative of extreme values from other gages in the area and particularly the Pennsylvania region. As an example the gage at Smethport, Pa., 140 miles northeast of the site, had a measured value of 15 inches in one hour and 30.8 inches of rain in 4.5 hours. This measured 15 inches for one hour supports the PMP estimate produced by the use of the HMR 51/52 methodology for a one square mile area. Precisely because of this variation in measurements of extreme rainfall from one place to another is the reason that general procedures have been developed that incorporate measured information from a larger region. And it was the occurrence of storms such as the one at Smethport that resulted in the revision of PMP values by the publication of HMR 51/52.</p>	<p>DLC has previously docketed information which indicates that the subject roofs are designed for loads of at least 72 psf (letters 2NRC-4-112, dated July 30, 1984, and 2NRC-5-019, dated February 11, 1985).</p> <p>The Smethport, PA, storm has been considered in the BV-2 PMP evaluation (HMR 33).</p>	

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	NRC POSITION	DLC POSITION	COMMENTS
RELATION OF NEW REQUIRE- MENT TO EXISTING REGULATORY POSITIONS	<p><u>III. ON RELATION OF NEW REQUIREMENT TO EXISTING REGULATORY POSITIONS</u></p> <p>As indicated previously, this Section in the table of Attachment 1 to the applicant's November 20, 1984 letter should be transposed to Section I, and in its place, provide the following staff restatement of the NRC position:</p> <p>The current SRP 2.4.2 states in Section III Review Procedures: "Construction permit (CP) stage reviews are carried out under this SRP section to evaluate the significance of the controlling flood level with regard to the plant design basis for flood protection. At the operating license (OL) stage, a brief review is carried out to determine if new information has become available since the CP review and to evaluate the significance of the new information with regard to the plant design basis for flood protection. New information might arise, for instance, from the occurrence of a new maximum flood of record in the site region, from identification of a source of major flooding not previously considered, from construction of new dams, from flood plain encroachments, or from advances in predictive models and analytical techniques. If the CP-stage evaluation of flooding potential has been carefully done, all sources of major flooding should have been considered and any new floods of record should fall well within the design basis. Improvements in calculational methods may occur, but generally will be concerned with increased accuracy in stream flow and water level predictions rather than with substantive changes in the flows and levels predicted. Where the OL review reveals that the controlling flood level differs more than 5% less conservatively from the CP evaluation, any supplemental provisions needed in the flood protection design basis should be directed toward early warning measures and procedures for assuring safe shutdown of the plant or toward minor structural modifications to accommodate the design flood level." Thus the requirement is a part of existing regulatory positions.</p> <p><u>DLC POSITIONS</u></p> <p>BVPS-2 meets GDC 2.</p> <p>BVPS-2 was designed prior to the issuance of HMR 51 and 52.</p> <p>Construction of the BVPS-2 safety related structures reached a significant percentage of completion prior to the issuance of HMR 52.</p> <p>No regulations provide for the use of HMR 51/52.</p> <p>No regulations require update of PMP evaluation methodology.</p> <p><u>NRC COMMENTS</u></p> <p>In the staff's view, the request that the effect of intense local precipitation be calculated using the updated data and analysis contained in HMR 51/52 for comparison with older analysis and data contained in HMR 33 is consistent with the responsibility of the Agency not to ignore new information which may affect the safety of the plant. Ordinarily such assessments are made generically. However, local precipitation effects relate to plant specific topography and must therefore be determined individually. DLC expressed concern in their response that plant construction has reached a point that change in design would have adverse effects on costs or schedule. Such considerations were anticipated in the Standard Review Plan and are explicitly discussed. Further, the document states that if the OL review shows that the controlling flood is significantly less conservative than from the CP evaluation, any supplemental provisions in the flood protection design basis should be accomplished through early warning measures and procedures for assuring safe shutdown of the plant or by minor structural modifications to accommodate the design flood level. None of the eight plants which have responded to this request have been required to make more than minor modifications. In summary, this application by the staff is consistent with the practices of the SRP and staff positions previously approved. Therefore, this is an exception from Chapter 0514 per Section 046.</p>	<p>As detailed on page 3 of this attachment, the staff's handling of HMR 51/52 is inconsistent with the handling of other codes, standards, and guidance.</p> <p>In spite of the staff's many references to the SRP's vague mention of new information, no existing regulation requires the use of HMR 51/52. Therefore, the burden of proof rests with the reviewers proposing the requirement. Until the staff has demonstrated that the use of HMR 51/52 is necessary to achieve an acceptable level of safety, no requirement exists.</p>	