NON-CONCURRENCE PROCESS
COVER PAGE

The U.S. Nuclear Regulatory Commission (NRC) strives to establish and maintain an environment that encourages all employees to promptly raise concerns and differing views without fear of reprisal and to promote methods for raising concerns that will enhance a strong safety culture and support the agency's mission.

Employees are expected to discuss their views and concerns with their immediate supervisors on a regular, ongoing basis. If informal discussions do not resolve concerns, employees have various mechanisms for expressing and having their concerns and differing views heard and considered by management.

Management Directive, MD 10.158, "NRC Non-Concurrence Process," describes the Non-Concurrence Process (NCP), http://nrcweb.nrc.gov:8600/policy/directives/catalog/md10.158.pdf.

The NCP allows employees to document their differing views and concerns early in the decision-making process, have them responded to (if requested), and attach them to proposed documents moving through the management approval chain to support the decision-making process.

NRC Form 757, "Non-Concurrence Process" is used to document the process.

Section A of the form includes the personal opinions, views, and concerns of a non-concurring NRC employee.

Section B of the form includes the personal opinions and views of the non-concurring employee's immediate supervisor.

Section C of the form includes the agency's evaluation of the concerns and the agency's final position and outcome.

NOTE: Content in Sections A and B reflects personal opinions and views and does not represent official factual representation of the issues, nor official rationale for the agency decision. Section C includes the agency's official position on the facts, issues, and rationale for the final decision.

At the end of the process, the non-concurring employee(s):

- [ ] Concurred
- [x] Continued to non-concur
- [ ] Agreed with some of the changes to the subject document, but continued to non-concur
- [ ] Requested that the process be discontinued
  - [ ] The non-concurring employee(s) requested that the record be non-public.
  - [x] The non-concurring employee(s) requested that the record be public.
- [ ] This record is non-public and for official use only.
- [x] This record has been reviewed and approved for public dissemination.

NRC FORM 757
NRC MD 10.158
(11-2014)

U. S. NUCLEAR REGULATORY COMMISSION

NON-CONCURRENCE PROCESS

NCP TRACKING NUMBER

SECTION A - TO BE COMPLETED BY NON-CONCURRING EMPLOYEE

TITLE OF SUBJECT DOCUMENT Proposed Rule 10 CFR 50.155 Mitigation of Beyond-Design-Basis Events, (d) Design features.	ADAMS ACCESSION NO. ML15049A201
DOCUMENT SIGNER Glenn Tracy	SIGNER TELEPHONE NO. 415-1388
TITLE NRO Office Director	ORGANIZATION NRO
NAME OF NON-CONCURRING EMPLOYEE(S) James Shea	TELEPHONE NUMBER 415-1388
TITLE Sr. Project Manager	ORGANIZATION NRO/DSEA/RHM2 on Detail from NRO/DARR/ARPB

☐ DOCUMENT AUTHOR ☑ DOCUMENT CONTRIBUTOR ☐ DOCUMENT REVIEWER ☐ ON CONCURRENCE

NON-CONCURRING EMPLOYEE'S SUPERVISOR Aida Rivera-Varona	
TITLE Branch Chief	ORGANIZATION NRO/DSEA/RHM2

☑ I WOULD LIKE MY NON-CONCURRENCE CONSIDERED AND WOULD LIKE A WRITTEN EVALUATION IN SECTION B AND C.

☐ I WOULD LIKE MY NON-CONCURRENCE CONSIDERED, BUT A WRITTEN EVALUATION IN SECTIONS B AND C IS NOT NECESSARY.

WHEN THE PROCESS IS COMPLETE, I WOULD LIKE THE NCP FORM: ☑ PUBLIC ☐ NON-PUBLIC

REASONS FOR NON-CONCURRENCE AND PROPOSED ALTERNATIVES (use continuation pages or attach Word document)

The proposed rule10 CFR 50.155 "Mitigation of Beyond-Design-Basis Events," section (d) "Design features" for new reactors is ambiguous and arbitrary does not require any measurable specific design enhancement. This rule will cause confusion for future design certification (DC) applicants as to the standard for "enhanced coping durations," as well as "minimize reliance on human actions." This inherent ambiguity could lead to different interpretations from both potential applicants and the NRC staff tasked with reviewing any proposed design requirements to meet this rule and therefore putting undue burden on the regulated community without a clear measurable substantial increase in overall protection of the public health and safety.

The rule would obfuscate the purpose of the mitigating strategies order (EA-12-049, March 12, 2012), intended to provide additional capabilities for an unspecified beyond design basis external events for power reactors in the form of the NRC staff endorsed "FLEX" strategies. Requiring new plant DCs to extend phase 1 installed equipment to 24 hours or more using unspecified "design features," to mitigate an unknown event, while minimizing reliance on operator actions may allow new plants to design "FLEX" strategies for a decay heat level that would be an order of magnitude less ((e.g. 200 gpm pump (decay heal level @ 24 hrs) vs 2,000 gpm pump (for decay heat level @ 4-8hr)), or eliminate "FLEX" completely. This could leave operators with potentially no mitigation ability for the "unknown unknowns" where the new design features as well as passive features could fail. It should be noted that the Fukushima unit 1 included a "designed passive system", that could theoretically meet all the proposed new reactor rule requirements. However at Fukushima unit 1 the isolation condenser, failed causing that plant to have the first meltdown and containment failure which contributed to the failure of Fukushima units 2 and 3 which relied solely on active systems for many hours into the event.

The level of enhancement for the proposed required design improvements has not been defined, and there is no process to evaluate the effectiveness of any credited enhancement. A concern is that any design enhancement(s) could introduce new unanalyzed initiating transient sequence (e.g. if automatic systems are installed to strip battery busses or require seismic trips for example), such that plant safety is actually reduced not enhanced.

[Continued -Attached]

SIGNATURE

DATE 2/20/15

Use ADAMS Template NRC-006 (ML063120159)

NRC FORM 757
NRC MD 10.158
(11-2014)

U. S. NUCLEAR REGULATORY COMMISSION

NCP TRACKING NUMBER

NON-CONCURRENCE PROCESS

TITLE OF SUBJECT DOCUMENT

ADAMS ACCESSION NO.

CONTINUATION OF SECTION ☑ A ☐ B ☐ C

(Non-Concurrence continued from Form 757 - JJS)
any specific so called safety enhancements beyond the "FLEX" requirements should be fully evaluated and not arbitrarily included in guidance or by NRC staff in the review process, specifically regarding requirements through guidance for seismic trip or battery bus stripping ect.

The rule language and its planned implementation unnecessarily biases designs with passive safety systems, as well as design certifications that have already been approved. The approved DCs including the recent ESBWR would be exempt from these design enhancements and could cause applicants to choose these designs simply to avoid addressing the new ambiguous Fukushima rule requirements. Some could suggest that a fully sized "FLEX" pump for decay heat after the first few hours following a trip for all plant designs is a superior mitigating strategy than one that would rely on an un-specified or arbitrary "design feature."

This rule could have the negative consequence of discouraging new designs in the short term as well as licensees from choosing designs that have not yet been approved that could have advanced safety features that would improve safety margins over those currently approved DCs. A simple analogy is that current licensees seem to keep the 1st generation plants operating through license renewal rather than building the safer new plants in part due to the uncertainty of regulatory cost, including this proposed rule.

The staff in its justification to forward fit DCs used the aircraft impact rule as an example for implementing the Commission policy on the regulation of advanced reactors. This is a very poor example for implementing Fukushima lessons learned because in that case plants could design against this very specific unlikely event. The Fukushima lessons learned, in part, showed that you can-not design against all potential beyond-design-basis events and therefore licensees need to include additional capabilities for these known un-knowns. If the staff knew specifically what the next event would be or was likely to be, it would be made part of a licensees design basis for the plant. The mitigating strategies as first conceived by the NRC with external stakeholders should be left to providing operators additional capabilities (FLEX strategies), in the unlikely event of an extended loss of all off-site and on-site ac power due to an unspecified event that can-not be pre-determined or designed against.

It is interesting to note that when a certain DC applicant proposed a mitigating strategy that included pre-designed and engineered non-safety systems that would meet the criteria advocated in this rule to "minimize reliance on human actions," they were rejected by the staff. These proposed strategies included using supplemental ac units with diverse locations, fuel sources as well as additional protections beyond design basis that seemed reasonable but they did not at the time meet guidance to assume loss of all on-site ac. The applicant was then coerced into mitigating strategies that entailed more operator actions using potentially less reliable strictly portable equipment.

The NRC should fully develop a risk informed external event(s) analyses that could provide a better defined basis for level of protection for design basis systems, structures and components and potentially the mitigating equipment used in the MBDBE rule for "FLEX" strategies. Currently, there is no industry, or government consensus on how to risk inform external events to better understand if design enhancements should be made or alternate protection of the safety related installed equipment should be required to ensure public health and safety. Arbitrarily requiring non-specific design changes to address the next unknown external event without adequately providing for the Commissioned approved mitigation using portable equipment may be premature and would not meet "adequate protection" as determined by the Commission in its approval of the mitigating strategies Order EA-12-049.

Since this rule would not seem to affect any current new reactor licensee or design certification and therefore it is unlikely to affect any new operating plant for the foreseeable future, the NRC staff should take the time to research external event risk to better inform any change to the Commission approved "FLEX" strategies designed to provide additional capabilities for operators to address the next known unknown event. Until fundamental research work is completed to better define external event risk as well as "adequate protection from these external risks, section (d), "Design features should be removed from this proposed rule.

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NRC MD 10.158
(02-2015)

U. S. NUCLEAR REGULATORY COMMISSION

NON-CONCURRENCE PROCESS

NCP TRACKING NUMBER

NCP-2015-003

SECTION B - TO BE COMPLETED BY NON-CONCURRING EMPLOYEE'S SUPERVISOR

TITLE OF SUBJECT DOCUMENT Proposed Rule 10 CFR 50.155 Mitigation of Beyond-Design-Basis Events, (d) Design features.	ADAMS ACCESSION NO. ML15049A201
NAME Aida Rivera-Varona	
TITLE Branch Chief	TELEPHONE NUMBER 415-4001
ORGANIZATION NRO/DSEA/RHM2	

COMMENTS FOR THE NCP REVIEWER TO CONSIDER (use continuation pages or attach Word document)

See Attached.

SIGNATURE	DATE 3/31/15

Use ADAMS Template NRC-006 (ML063120159)

Section B. "Comments for the NCP Reviewer to Consider"

As the Branch Chief of the individual that wrote the non-concurrence, I respect his opinion and willingness to engage in this process. It is part of our values and helps us make the best-informed decisions. The non-concurring individual (NCI) was an active participant on the working group tasked with developing the rulemaking package. The NCI participated in numerous meetings with the working group as the relevant regulatory positions were developed, and has been consistent in his opposition to the portion of the proposed rule which is now the subject of the non-concurrence. Additionally, the NCI has reviewed and commented on the implementing guidance for this portion of the proposed rule. Thus, the NCI is familiar with the proposed rule and guidance.

I have used the agreed upon summary of issues that the non-concurrence coordinator developed with the NCI. I address each of these concerns below. Note that references in the non-concurrence to "the rule" refer specifically to paragraph (d) of the proposed 50.155.

Background

First, the staff, in developing the proposed rule (i.e., 50.155 "Mitigation of Beyond-Design-Basis Events"), seeks to obtain Commission approval to issue for public comment a proposed rule that, in part, would codify requirements previously imposed by order for mitigation of beyond-design-basis external events. Other parts of the proposed rule include provisions for spent fuel pool level instrumentation and items that are not the subject of the non-concurrence.

Paragraph 50.155(d), which is the subject of the non-concurrence, is specific to new reactor applicants. This paragraph would require applicants to incorporate design features at the design stage to enhance coping durations and reduce reliance on operator action to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities during an extended loss of all ac power concurrent with a loss of normal access to the ultimate heat sink.

It is important to understand the intent of the staff in adding this paragraph to the proposed rule. Central to the staff's intent is our responsibility to develop and provide for Commission consideration, reasoned and well formulated positions that further the Commission's policies and enhance the safety of the public.

Concern 1 - This proposed rule 10 CFR 50.155 Mitigation of Beyond-Design-Basis Events (d), "Design features" is ambiguous and will cause confusion for design certification (DC) applicants as well as NRC staff reviewers.

The NCI stated that "[t]he proposed rule is ambiguous and arbitrary" and "will cause confusion."

Consistent with agency practice, the proposed rule paragraph (50.155(d)) is written at a high level and is performance-based, consistent with all other portions of the proposed rule. The rule establishes high level objectives and the supporting guidance documents describe in greater

detail what is necessary to comply with the overall rule. The general approach to the proposed rule language in 50.155(d) is similar to the other parts of the proposed rule and is consistent with other recently issued rules. For example, the rule language used in 10 CFR 50.150, the Aircraft Impact Assessment rule (AIA), which has been successfully implemented, also requires applicants to:

> "identify and incorporate into the design those design features and functional capabilities to show that, with reduced use of operator actions: (1) The reactor core remains cooled, or the containment remains intact; and (ii) Spent fuel cooling or spent fuel pool integrity is maintained."

While the external event being addressed by the AIA rule is different from the events being addressed by the MBDBE proposed rule, the language in both is similar, and both rules are consistent with the Commission Policy Statement that new reactors safety system designs reduce required operation actions.

The NCI indicated that "[t]his rule will cause confusion for future design certification (DC) applicants..." The proposed rule package includes draft guidance that provides details for design certification vendors on how to address the proposed rule for new reactors. The guidance provides flexibility in the selection of design features to meet the proposed requirements.

The other phrase cited by the NCI as causing confusion is "enhanced coping durations." The staff's meaning of this phrase is provided in the implementing guidance in DG-1301, Appendix A, Sections 3.1, 3.2, and 3.3. For example, Section 3.1 states:

> "To satisfy the NRC's requirements in 10 CFR 50.155(d) to enhance coping durations, the applicant should provide reasonable assurance that mitigation during the initial response phase can be accomplished using only installed plant equipment for at least 24 hours following an ELAP and LUHS."

If approved by the Commission, the staff would issue the proposed rule and draft guidance for public comment and, through that process, address any issues that may arise. When the proposed rule and draft guidance are considered in totality, they provide clear expectations on what is required. Further, the staff plans to engage design certification vendors and have specific discussions on the clarity and specificity of the rule language and guidance.

The NCI also stated that the proposed rule "does not require any measurable specific design enhancement." This is correct. The staff did not want to impose specific design enhancements; rather, the staff is establishing specific performance objectives and applicants have the flexibility in the selection of the specific design features to meet those objectives. The staff is appropriately mindful that the design certification vendors are in the best position to make these design decisions. The vendors have design procedures and practices that ensure consistent consideration of numerous design objectives and are best positioned to ensure the integrity of

the design process. Staff has already seen in the international community a variety of forms on how design vendors can meet these proposed requirements.

Concern 2 - The rule would obfuscate the purpose of the mitigating strategies order which requires "additional capabilities," not "designed enhancements"... and could leave operators with potentially no mitigation ability, for an un-known beyond "enhanced" design basis event.

To be clear, the mitigating strategies order (EA-12-049) was never intended for new reactor applicants. The Order was issued as an adequate protection requirement and the initial order and associated guidance was appropriately focused on the safety of the existing operating fleet of reactors. In the SECY paper (SECY-12-0025), that forwarded proposed draft orders to Commission, the staff indicated that for new reactors the Commission-approved Fukushima actions are to be addressed prior to certification or licensing. The staff stated in the SECY that there was going to be coordination between operating and new reactor staff to assure that the resolutions proposed by new reactor design certification and combined license applicants are not in conflict with those proposed and accepted by the staff for operating reactors. Thus, it is my view that the rule would not obfuscate the purpose of the Orders, particularly when one considers that neither the Order nor the implementing guidance for the operating fleet was intended for new reactors applicants. Now that the staff and industry have had some time to reflect on alternative approaches to addressing these issues specifically for new reactors, the staff is considering alternative means to satisfy the purpose.

The staff discussed in the regulatory basis the purpose of the rule which states, in part, "[w]hile the requirement to include design features would result in an improved capability to mitigate the effects of such an event, the NRC does not intend for licensees to rely solely on these design features. In light of the unknown severity, duration, or other aspects of beyond-design-basis events, it is important for a licensee to have diverse, flexible strategies for addressing such events that include design features as one aspect of those strategies. " Thus, the intent of rule is to provide for a greater mitigation capability and not less.

Specific examples raised by the NCI include

"... DC applicants will have to extend phase 1 installed equipment to 24 hours or more using unspecified 'design features'."

In the implementing guidance, the staff has indicated specific criteria to meet the rule. The staff is offering quantified design goals including the design objective of extending the capability of the installed SSCs to enable coping for the loss of all ac power for 24 hours using only installed equipment while still meeting all the safety functions of core, containment, and spent fuel pool cooling. As indicated previously, the staff is not dictating specifically which design features must be used to achieve these functions. While the NCI indicates this is a deficiency in the rule and guidance, the staff views this language as offering design vendors quantifiable performance criteria that vendors can design to.

"[A]llow new plants to design "FLEX" strategies for a decay heat level that would be an order of magnitude less ((e.g. 200 gpm pump (decay heal level @ 24 hrs) vs 2,000 gpm pump (for decay heat level @ 4-8hr)), or eliminate "FLEX" completely."

The rule and guidance do not dictate specific pump performance characteristics nor does the rule or guidance specify decay heat levels. However, paragraph (d) of the rule is intended to apply to design vendors while applicants for operating licenses or combined licenses would have to provide strategies to meet the requirements included in the other portions of the rule. It is possible that a vendor could design a system that would be sufficiently effective to allow a smaller "FLEX" pump that would otherwise be required with a less robust design. However, as long as the key safety functions are maintained in the event of a loss of all AC power concurrent with a loss of normal access to the ultimate heat sink, it is unclear what is deficient with this approach.

"[T]he Fukushima unit 1 included a "designed passive system," that could theoretically meet all the proposed new reactor rule requirements. However at Fukushima unit 1 the isolation condenser failed causing that plant to have the first meltdown and containment failure."

The "designed passive system" referred to is the isolation condenser in the BWR Mark I design. While the details of the events at unit 1 are still being analyzed, it appears that an operator action to deactivate the system coupled with a subsequent loss of power left the operators unable to reactivate the system. This is the sequence of events that the rule is intended to address.

Concern 3 - The level of design enhancement is not specified in the proposed rule (how much or how high) and there is no process to evaluate the effectiveness of the required design enhancements outlined in the draft regulatory guide such as seismic trip or automatic bus stripping or to evaluate the contribution to plant risk due to spurious actuations of these design enhancements.

As directed by the Commission in previous rulemakings, the proposed rule is one that is performance based. The rule and guidance refer to "enhanced coping durations" and the implementing guidance provides specific objectives with respect to the timing durations expected for the various phases of the response strategies. For example, the guidance at Appendix A section 3.1 specifies the relevant functions of core cooling, spent fuel and containment cooling must be achieved for 24 hours with specifications for which types of equipment can be credited in the first 8 hours and what types of systems can be credited thereafter.

The NCI also mentions a concern that "any design enhancement(s) could introduce new unanalyzed initiating transient sequence." I agree with this concern but assert that the introduction of unintended consequences is always present when plant modifications are being considered. It is the staff's position that the best time to introduce such changes is during the design process when holistic design reviews are conducted. Industry design practices and staff

reviews routinely look for and assess such issues as inadvertent actuation of systems and system interactions. It is during the design phase that vendors have the greatest flexibility in engineering systems in an efficient and effective manner to achieve the objectives of the rule. The staff will fully review during design certification and evaluate the design using the developed guidance to minimize unintended consequences.

Concern 4 - The rule language and its planned implementation unnecessarily biases designs with passive safety systems as well as approved DCs. Design enhancements or credited passive systems may obviate the need for "FLEX" equipment and strategies potentially leaving insufficient capabilities to mitigate the consequence of beyond design basis events.

In my view, the rule is not biased towards designs with passive safety systems. Through the applicability statements it is clear that Paragraph (d) of the rule is intended to be applied only to applicants. Thus the recently certified ESBWR does not have to comply with paragraph (d). As a practical matter, the staff looked at the passive features of the ESBWR and the AP1000 designs and found that these already achieved much of the benefits sought by the staff in crafting the new rule. However, it is the staffs' view that active designs can also fully comply with the rule and conform to the implementing guidance. The staff is currently seeking public comments on the applicability of this proposed rule for DC renewals, for which then the proposed rule would need to be addressed.

Concern 5 - DCs that have already been approved are not required to meet the proposed rule therefore applicants may choose these designs to avoid these rule requirements.

While this assertion is speculative as for the proposed rule to be a dominate motivating factor in the selection of a design technology by a prospective licensee, the staff does wish to remain mindful of the potential negative impacts of its regulatory decisions. Fundamentally, the staff is cautious about taking positions which may end up being contrary to the enhancement of safety. The staff view is that this proposed rule will enhance safety, and it will be up to the utilities to make their own corporate decisions. The staff does not believe that the proposed rule will cause utilities confusion or be disproportionally influenced by the rule in selecting technologies.

Another element of this concern that the NCI raised is that current licensees will seek renewal rather than building new safer plants. The staff view is that each licensee makes their own corporate investment decisions, based on different factors, including power demand, other available technologies; and, this proposed rule is only a minimal influence in the overall decision making.

Concern 6 - The staff in its justification to require future DC applicants to meet the proposed rule used the aircraft impact rule as an example for implementing the Commission policy on the regulation of advanced reactors. Aircraft impact is a specific event that could be designed against, mitigation capabilities that can be employed by operators within the first 8 hours should be available for an unspecified external event exceeding the design basis including potentially the "enhanced" design basis.

In this proposed rulemaking, the staff does draw some parallels to the AIA rule. As previously discussed, the staff did use language similar to the AIA rule in the phrase "reduced reliance on operator actions." Further, the staff is drawing upon elements of the Commission Policy statements on Severe Accidents and the policy statement on advanced reactors. In those policy statements, the Commission established the expectation that new reactors should be safer than current designs. Through design certification, the staff is providing design vendors the ability to be more flexible and early on add design features to address and provide extra capabilities. This is consistent with Commission guidance on severe accidents and the policy statement on advanced reactors.

Concern 7 - The NRC should fully develop a risk informed external event(s) analyses that could provide a better defined basis for level of protection for design basis systems, structures and components and potentially for protecting mitigating equipment used in the "FLEX" strategies before arbitrarily requiring design enhancements for an unknown event.

In my view, the rule is not being written for an unknown event. The proposed rule is to address a specific plant condition- a loss of all AC power concurrent with a loss of normal access to the ultimate heat sink. The rule also specifies what plant capabilities must be maintained (i.e., core cooling, containment and spent fuel cooling). So the rule is not addressing an unknown plant condition. Further the proposed rule also establishes how severe of a beyond design basis external event the mitigating strategies are expected to protect against. The staff and Commission decided that the mitigating strategies should protect against external hazards as severe as those established by our current licensing and siting guidance, as estimated by modern methods and analytical tools. All external hazards are established based on probabilistic and risk informed methods with the exception of flooding. For flooding, many share the view that the current guidance results in extremely conservative estimates of the hazard. While this view is not held by all, it is logical to reason that if the flooding hazards are extremely conservative then their use to establish mitigating strategies protection standards would increase the likelihood that the mitigating strategies will be available for nearly any unknown flood hazard, which is the desired intent of the rule.

Additionally, the Office of Research has prepared a research plan to develop probabilistic flood hazard methods. The probabilistic flood hazard research plan along with a joint NRR and NRO user need should provide the staff with tools to estimate more risk informed flood hazards and assess if current food hazards are extremely conservative.

Concern 8 - Arbitrarily requiring non-specific design changes to address the next unknown external event without adequately providing for the Commission approved mitigation using portable equipment may be premature and may not meet the level of "adequate protection" as determined by the Commission in its approval of the mitigating strategies Order EA-12-049.

The staff does not view the proposed rule as arbitrary. To the contrary, the rule and guidance provide specific performance objectives for applicants to address in their designs. Further it is

also important to state that the Order and the proposed rule are intended to address a very specific and well defined condition which is the extended loss of all ac power sources concurrent with the loss of the ultimate or normal heat sink, depending on the active or passive nature of the design.

Order EA-12-049 was issued under adequate protection and through the orders and this rulemaking all reactors will be required to meet the adequate protection requirements of the Commission. Establishing what set of conditions constitute adequate protection is the purview of the Commission and through this rulemaking the staff is offering for Commission decision the staff's interpretation of the direction provided in various SRMs. In my view, the adequate protection aspects of this rule are achieved through a combination of installed SSCs, on-site portable equipment, and off-site equipment, together with the procedures, training, and drills. It is this holistic combination of elements that achieve adequate protection. I interpret the orders and the rule to establish what constitutes adequate protection and the orders and rule affords a degree of flexibility for each licensee and applicant to offer a specific combination of installed and portable equipment to achieve compliance. Neither the rule nor the implementing guidance permits an inadequate provision for portable equipment. The order, rule, and implementing guidance leave open the degree to which portable equipment is relied upon in developing the mitigating strategies. The staff's intent in offering paragraph (d) of the rule is to afford design vendors additional flexibility in shifting the balance toward more reliable designed features that would extend the time available before portable equipment is necessary.

The NCI also makes a final recommendation in his non-concurrence that since this portion of the rule is unlikely to affect any new operating plant in the foreseeable future, the Commission should remove this portion of the proposed rule until staff do research and develop a risk informed approach to external events.

The applicability statements indicate which applicants would be subject to the rule. It is correct that current licensees and certified designs are not subject to the proposed paragraph (d). However, there are current applicants which would be subject to the proposed paragraph. The research proposed by the NCI is being planned by the staff and will take a number of years to complete. The staff believes it is prudent to proceed with this proposed rule with the provisions for design features and put the question before the commission to make a determination on the appropriateness of the proposed approach. Once a risk-informed approach to external events is developed, the staff can always go back and update the proposed guidance to this rule to incorporate any new information that becomes available.

In summary, I do not agree with the non-concurring individual. While I appreciate the perspective of the NCI, in my view, it is incumbent upon the staff to offer to the Commission a substantive well formulated option for their consideration. The Commission has, on a number of occasions, recognized issues that are better addressed through design. The interpretation of Commission Policy statements can be challenging and the agency is best served by putting before the Commission a clear well thought through proposal for their consideration.

NRC FORM 757
NRC MD 10.158
(02-2015)

U. S. NUCLEAR REGULATORY COMMISSION

NON-CONCURRENCE PROCESS

NCP TRACKING NUMBER

NCP-2015-003

SECTION C - TO BE COMPLETED BY NCP COORDINATOR

TITLE OF SUBJECT DOCUMENT Proposed Rule 10 CFR 50.155 Mitigation of Beyond-Design-Basis Events, (d) Design features.	ADAMS ACCESSION NO.
NAME Glenn Tracy	
TITLE Office Director	TELEPHONE NUMBER 415-1388
ORGANIZATION NRO	

AGREED UPON SUMMARY OF ISSUES (use continuation pages or attach Word document)

See attached.

EVALUATION OF NON-CONCURRENCE AND RATIONALE FOR DECISION (use continuation pages or attach Word document)

See attached.

TYPED NAME OF NCP COORDINATOR John McKirgan	TITLE Branch Chief
ORGANIZATION NRO/DSRA/SCVB	
SIGNATURE--NCP COORDINATOR	DATE
TYPED NAME OF NCP APPROVER Glenn Tracy	TITLE Office Director
ORGANIZATION NRO	
SIGNATURE--NCP APPROVER	DATE 3/31/15

Section C, "Agreed Upon Summary of Issues"

NRO staff and management met with the NCI to discuss the non-concurrence and develop a proposed summary of issues. On March 13, 2015, the NCI agreed that the following concerns represents the summary of agreed upon issues.

Concern 1 - This proposed rule 10 CFR 50.155 Mitigation of Beyond-Design-Basis Events (d), "Design features" is ambiguous and will cause confusion for design certification (DC) applicants as well as NRC staff reviewers.

Concern 2 - The rule would obfuscate the purpose of the mitigating strategies order which requires "additional capabilities," not "designed enhancements"... and could leave operators with potentially no mitigation ability, for an un-known beyond "enhanced" design basis event.

Concern 3 - The level of design enhancement is not specified in the proposed rule (how much or how high) and there is no process to evaluate the effectiveness of the required design enhancements outlined in the draft regulatory guide such as seismic trip or automatic bus stripping or to evaluate the contribution to plant risk due to spurious actuations of these design enhancements.

Concern 4 - The rule language and its planned implementation unnecessarily biases designs with passive safety systems as well as approved DCs. Design enhancements or credited passive systems may obviate the need for "FLEX" equipment and strategies potentially leaving insufficient capabilities to mitigate the consequence of beyond design basis events.

Concern 5 - DCs that have already been approved are not required to meet the proposed rule therefore applicants may choose these designs to avoid these rule requirements.

Concern 6 - The staff in its justification to require future DC applicants to meet the proposed rule used the aircraft impact rule as an example for implementing the Commission policy on the regulation of advanced reactors. Aircraft impact is a specific event that could be designed against, mitigation capabilities that can be employed by operators within the first 8 hours should be available for an unspecified external event exceeding the design basis including potentially the "enhanced" design basis.

Concern 7 - The NRC should fully develop a risk informed external event(s) analyses that could provide a better defined basis for level of protection for design basis systems, structures and components and potentially for protecting mitigating equipment used in the "FLEX" strategies before arbitrarily requiring design enhancements for an unknown event.

Concern 8 - Arbitrarily requiring non-specific design changes to address the next unknown external event without adequately providing for the Commission approved mitigation using portable equipment may be premature and may not meet the level of "adequate protection" as determined by the Commission in its approval of the mitigating strategies Order EA-12-049.

Section C, "Evaluation of Non-Concurrence and Rationale for Decision"

I wholly support the individual's (NCI's) efforts in utilizing our agency non-concurrence process to share his concerns on a specific section (paragraph 50.155(d)) of the proposed Mitigation of Beyond-Design-Basis Events (MBDBE) rulemaking and the associated draft regulatory guide. This section of the proposed rule would require new reactor applicants to incorporate design features that would enhance coping durations and reduce reliance on operator actions during an extended loss of all ac power. Expressing one's differing views is in keeping with the Agency's values and the positive open and collaborative work environment that the Office of New Reactors (NRO) strives to foster every day. Additionally, I strongly believe these processes lead to better decision-making and regulatory actions.

Regarding the specific concerns expressed by the NCI, Section B provides a comprehensive discussion and evaluation of each of the matters. I fully endorse the discussion and evaluation in Section B, and therefore will not repeat or paraphrase it in this section. That rationale is incorporated in my final decision and is augmented by the discussion below.

The issue at hand is about the appropriate safety policy that the agency should take for new reactors to implement mitigating strategies. While the overall goal is the same for both new and operating reactors, the method for achieving this goal for new reactors capitalizes on the opportunities available during design. New reactor applicants can incorporate into their designs those features for mitigating strategies that provide enhanced ability to ensure that core cooling, containment, and spent fuel pool cooling is maintained or restored. Such design features should reduce and simplify the manual actions and reduce the portable equipment necessary to maintain these safety functions, and allow more time to properly assess plant conditions and the use of installed equipment, as compared to current operating reactors. This approach is consistent with the Commission Policy Statement on the Regulation of Advanced Reactors, in which the Commission previously encouraged vendors to include such design features in the design. The staff's proposal in this paper should be viewed as an application of the Commission's Policy expectations for new reactors being applied to the Fukushima lessons-learned recommendations.

The regulatory approach of establishing alternative design requirements for new reactor applicants to enhance margins of safety for adequate protection and for beyond-design-basis events has been used successfully in the past. For example, Title 10 of the Code of the Federal Regulations (10 CFR) 50.150, "Aircraft Impact Assessment," requires new reactor applicants, in part, to perform an assessment and incorporate into the design capabilities to assure core cooling or containment integrity, and spent fuel pool cooling or integrity. Additionally, the Commission established enhanced policy expectations for new reactors to meet safety requirements recognizing the opportunities that are available during the design stage. For example, in the SRM dated June 26, 1990, on SECY-90-016, the Commission directed that new reactors address 10 CFR 50.63, "Loss of All Alternating Current Power," through installation of an alternate ac source. Additionally, in the SRM on SECY-90-016, the Commission directed that new reactors provide physical separation for equipment for fire protection, rather than rely

upon fire barriers, for meeting 10 CFR 50.48, "Fire Protection," and Appendix R to 10 CFR Part 50, "Fire Protection Program for Nuclear Power Facilities Operating prior to January 1, 1979," to ensure that safe shutdown can be achieved, assuming the loss of a fire area. In the case of mitigating strategies for new reactors, the staff would follow a similar approach, with a focus on resolving mitigating strategies issues through design features, as appropriate.

In making this decision, I also reflected upon the experiences and learnings that the NRC's senior leadership team acquired from our trip to Japan and the Fukushima Dai-ichi site in 2014. One of the fundamental insights of the senior leadership team was the need to ensure that the nuclear industry and the NRC are prepared for the unexpected, including ensuring the capability of installed equipment to provide time to execute mitigating strategies. Mitigating strategies are about furthering defense-in-depth for nuclear reactors; and in my judgment, we must strive to achieve the proper balance between hardened installed safety systems and portable backup equipment. The assured availability of installed plant safety systems can provide crucial additional time for operators in a crisis. Time, during any crisis, is a precious asset and the lack of time is an overwhelming handicap. Planning to mitigate a future crisis requires addressing the critical need for ample time amidst unforeseen obstacles. As opportunities are available for new reactor designs, these tenets (i.e., sufficient installed design capacity and response time) provide the foundation for development of the proposed paragraph 50.155(d).

In summary, I appreciate the NCI's willingness to bring forth his views and engage in constructive dialogue. In order to ensure Commission awareness of this alternate perspective, a paragraph has been added to the SECY paper and the non-concurrence is provided as an enclosure.