NRR-PMDAPEm Resource

From: MAUER, Andrew [anm@nei.org]
Sent: Tuesday, April 28, 2015 8:15 AM
To: DiFrancesco, Nicholas
Cc: TSCHILTZ, Michael; Richards, John <jrichards@epri.com>
Subject: HF Confirmation - Sections 4.6 and 4.7
Attachments: HF Confirmation - Draft Sections 4.6 and 4.7 - Clean.docx

Nick, During our last public meeting, we committed to provide proposed text for draft Sections 4.6 and 4.7 of the High Frequency Application Guide. These sections are attached. In addition, we expect to provide another update to the guide based on the discussion during the March meeting in advance of our May 21 meeting.

Thanks,
Andrew

Hearing Identifier: NRR_PMDA
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From: MAUER, Andrew

Created By: anm@nei.org

Recipients:
"TSCHILTZ, Michael" <mdt@nei.org>
Tracking Status: None
"Richards, John <jrichards@epri.com>" <jrichards@epri.com>
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4.6High Frequency Confirmation Resolution Options

Currently in the draft report:

This selection is being developed and will be discussed in the meeting. As shown in Figure 4-1, the resolution options for cases where the capacity/demand ratio is < 1 include replacing the component with a more rugged component, crediting Operator actions, or performing a more refined evaluation to better estimate the component mounting point demand or the component capacity.

Proposed text:

A number of options are available to resolve cases where the component HCLPF capacity is not greater than the CDFM mounting point demand.Those options generally fall into four options; additional component testing, refined mounting point seismic demandestimates, operator actions, and plant modifications. Additional considerations are provided below.Other resolution methods may be used where technically justified.

<u>Additional component testing</u>

Component shake table testing can be a valuable tool in resolving specific cases where the HCLPF capacity is not greater than the CDFM mounting point demand. If component specific high frequency capacity data is not available, and if extending the 4-to-16 Hz capacity data as shown in Figure 4-5 is not adequate, then additional component specific high frequency testing would be necessary to provide the component capacity.

In some cases, there may be a significant difference between the mounting point demands in the three orthogonal directions. In these cases, it may be helpful to retest a component to account for those directional demand differences and show that the component can properly function with the location specific seismic demands.

In other cases, it may be possible to show that the downstream component requires more than 2 ms of contact chatter to malfunction. One way to treat this in a seismic test is to wire the downstream component to the primary component during the seismic test to demonstrate that chatter in the primary component does not cause the downstream component to malfunction.

<u>Refined mounting point seismic demandestimates</u>

The criteria specified in Sections 4.3 and 4.4 provide generic estimates of in-structure and in-cabinet amplification factors. More detailed site specific and component location specific seismic demand estimates may provide more realistic mounting point seismic demands. These more

detailed estimates may use previous analyses or test data to support the more refined seismic demands.

Operator Actions

Other relay chatter affects can be resolved by Operator Actions. Examples of this resolution strategy include resetting lockout or seal-in relays that lead to undesired plant conditions.Credited operator actions should be addressed in plant procedures. Care should be exercised to avoid overloading the Operators by crediting too many Operator Actions.

Plant modifications

There are a number of plant modification options that can be used to resolve cases where the component capacity is less than the mounting point demand. For example, sensitive components with moderate or low seismic capacities can be replaced with comparable components with higher seismic capacities. Alternatively, components can be moved to a location where the mounting point seismic demand is less than the component capacity.

Another acceptable option would be to implement modifications to the circuit such that the seal-in or lockout chatter does not cause misoperation. For example, a time delay relay could be added downstream of the chatter sensitive relay to filter out the contact chatter.

4.7High Frequency Confirmation Report Content

Currently in the draft report:

This selection is being developed and will be discussed in the meeting.

Proposed text:

Each plant screening in to perform High Frequency Confirmation using the criteria in the SPID [3] should submit a report to the NRC describing their evaluation and results.

For plants using the Low Spectral Acceleration screening in Section 3.1.1, the High Frequency Confirmation submittal should include the SSE and GMRS information in graphical and tabular form along with text noting that the GMRS accelerations are within the limits identified in Section 3.1.1, therefore, no additional evaluation is necessary.

For plants using the Limited High Frequency Exceedance screening in Section 3.1.2, the High Frequency Confirmation submittal to the NRC should include the following.

- SSE and GMRS information in graphical and tabular form
- The calculated exceedance area percentage consistent with the criteria in Section 3.1.2
- Text noting that the GMRS exceedances are consistent with the criteria identified in Section 3.1.2, therefore, no additional evaluation is necessary.

For plants performing a site-specific High Frequency Confirmation evaluation, a report should be prepared summarizing the evaluations and results and submitted to the NRC for review following completion of the evaluations (schedule *TBD*). The level of detail provided in the reportshould be sufficient to enable NRC to understand the inputsused, the evaluations performed, and the decisions made as a result of the high-frequency evaluations. It is not necessary to submit HCLPF calculations although relevant documentation should be cited in the submittal, and be available for NRC review on-site in an easily retrievable form.

The report should include the following information.

- A description of the equipment scope selection process (*The final equipment scope guidance needs to be settled before this part of the report scope can be identified.*)
- A list of the specific componentsidentified for high frequency confirmation including the plant specific component ID, component type (relay, contactor, etc.) model number, and locations in the plant (floor elevation, enclosure type)

- A plot of the GMRS submitted by the licensee in accordance with the 50.54(f) letter and EPRI 1025287 [3] and tabulated the values
- A description of the estimated vertical GMRS including the information used to select the applicable site Class in Table 3-1 (horizontal PGA and V_S30 values) and a plot of the vertical GMRS along with tabulated values
- A table listing the results of the component evaluations for the components listed above (e.g. capacity > demand, Operator action to reset, resolution required)
- A table listing any components where the component capacity is not shown to be greater than the estimated demand and a planned resolution schedule. Alternately, the resolution schedule may be contained in the utility transmittal letter to the NRC for the High Frequency Confirmation report.
- An appendix showing two sample component evaluations including the following information for each example
    - A description of the component being evaluated (component type, manufacturer, model number, other relevant component specific information)
    - A description of the location of the component including building, floor elevation, enclosure type
    - A description of the mounting point demand estimate including the in-structure and in-cabinet amplification factors used
    - A description of the component capacity and the basis for that capacity (e.g. reference to the test information)
    - The values for the parameters used in the horizontal and vertical capacity to demand high frequency component evaluations and the resulting $TRS/ISRS_c$ ratio.