



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

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CNL-17-003

April 12, 2017

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Watts Bar Nuclear Plant, Units 1 and 2  
Facility Operating License Numbers NPF-90, 96  
NRC Docket Numbers 50-390, 50-391

Subject: **UPDATE TO THE TENNESSEE VALLEY AUTHORITY'S RESPONSE TO NRC LETTER CONCERNING A CHILLED WORK ENVIRONMENT FOR RAISING AND ADDRESSING SAFETY CONCERNS AT THE WATTS BAR NUCLEAR PLANT**

- References:
1. NRC letter to TVA, "CHILLED WORK ENVIRONMENT FOR RAISING AND ADDRESSING SAFETY CONCERNS AT THE WATTS BAR NUCLEAR PLANT," (EA-16-061) dated March 23, 2016
  2. TVA letter to NRC, "RESPONSE TO NRC LETTER CONCERNING A CHILLED WORK ENVIRONMENT FOR RAISING AND ADDRESSING CONCERNS AT THE WATTS BAR NUCLEAR PLANT," dated April 22, 2016.

The purpose of this letter is to provide an update to Tennessee Valley Authority's (TVA) efforts to address and correct the chilled work environment at the Watts Bar Nuclear (WBN) Plant. In our response letter dated April 22, 2016 (Reference 2), TVA acknowledged that a work environment inconsistent with TVA core values and behaviors existed. TVA reaffirmed its commitment to ensuring that a healthy nuclear safety culture and healthy safety conscious work environment exist across TVA's nuclear fleet, where employees feel free to raise concerns without fear of retaliation. Our response discussed the initial actions taken, actions in progress and planned future actions. These actions were documented in the TVA Chilled Work Environment Action Plan attached to our April 22, 2016 response letter and in the WBN Corrective Action Program (CAP), and addressed the nuclear safety culture and safety conscious work environment elements and actions in your letter of March 23, 2016 (Reference 1).

The status of these actions is being monitored through assessments, surveys and senior management oversight. Adjustments to the actions have been and will continue to be made based on insights gained.

The chilled work environment action plan and a root cause analysis were initiated beginning in April 2016. The status of the chilled work environment action plan, the root cause analysis results and corrective actions were shared with the NRC at a Public Meeting held on May 24, 2016. Actions were implemented throughout the summer of 2016 and many actions have been completed. As noted previously, the WBN Senior Leadership Team recognized the need to assess and adjust actions to ensure that identified causes were actively and effectively addressed to improve the work environment at Watts Bar.

To that end, in August 2016, Watts Bar tasked Conger & Elsea, an independent consulting firm, with providing assessments of the status of the Watts Bar safety conscious work environment, the adequacy and effectiveness of the Chilled Work Environment Root Cause Analysis and associated corrective actions, and the completeness of TVA's April 22, 2016, Chilled Work Environment Response Letter (Reference 2). In support of these assessments, the Conger & Elsea Team conducted a series of interviews and focus groups, with participants representing greater than ten percent of the TVA WBN employee population across all organizational levels and functional groups.

Based on these assessments, the Conger & Elsea Team concluded that:

- chilled work environment precursors and concerns existed in other functional areas beyond Operations,
- improvement was needed to build mutual respect and demonstrate that workforce input was valued, and
- gaps in effective safety communications existed.

Conger & Elsea recommend the following actions:

- The root cause analysis conducted for the chilled work environment should be re-opened and evaluated using an additional analysis tool to assess organizational and programmatic issues.
- TVA's April 22, 2016, Chilled Work Environment Response Letter (Reference 2) should be updated to provide the status of actions taken and the additional actions planned to address the Conger & Elsea findings and recommendations.

In September 2016, the NRC conducted a Problem Identification and Resolution (PI&R) Inspection at Watts Bar. On October 26, 2016, the NRC issued an inspection report detailing the results of the September inspection. The NRC conducted a second PI&R Inspection at Watts Bar in November 2016. On March 10, 2017, the NRC issued the PI&R Inspection Report (Part 2) and Safety Conscious Work Environment (SCWE) Issue of Concern Follow Up NRC Inspection Report. Based on that the NRC documented one apparent violation because TVA was not implementing certain review processes required by a Confirmatory Order from November 2014 to August 2016. TVA is currently conducting a Root Cause investigation to determine causes and has notified the NRC of intentions to pursue Alternate Dispute Resolution. The Root Cause Investigation will identify additional corrective actions relative to the Adverse Action Process that are not currently documented in Attachment 1. The report also documented a Severity Level IV NCV of 10 CFR 50.9 (a) related to TVA's initial response to the Chilled Work Environment Letter. TVA is reviewing the NRC's position and assessing actions that may be taken in response.

TVA has revisited its current approach and chilled work environment action plan to incorporate Conger & Elsea recommendations, NRC observations from the PI&R Inspections and TVA management observations. Based on these insights and feedback from our employees in the form of pulse surveys and nuclear safety culture monitoring panel meetings TVA has refined its focus areas to define WBN's goals in meeting its commitment to a healthy Nuclear Safety Culture (NSC) and SCWE. While all of the nuclear safety culture attributes are being reinforced at Watts Bar, four specific focus areas were chosen that address the feedback received from our employees and promote a respectful work environment where employees are willing to raise concerns.

Those focus areas are:

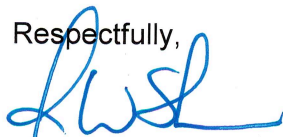
- Safety has priority over production
- CAP is effective
- Management and employee mutual respect
- NSC is understood and reinforced

In direct support of these focus areas, WBN updated the chilled work environment action plan to align and implement additional actions and assessment tools. Attachment 1, "Chilled Work Environment Action Plan, Revision 1," contains actions that are aligned to the goals described above. Attachment 2, "TVA Chilled Work Environment Metrics," contains metrics WBN has developed to measure the progress toward achieving improvement in each of the focus areas. Finally, to obtain a comprehensive understanding of the safety conscious work environment at Watts Bar, Attachment 3, "Commitments," contains a commitment to conduct an independent safety culture assessment in the summer of 2017. Following a review of the assessment results in the fall of 2017, TVA will engage the NRC to conduct a public meeting to present the results.

The Watts Bar Senior Leadership Team is committed to achieving a strong and healthy NSC and a respectful work environment where workers are willing to raise concerns without fear of retaliation and expect those concerns to be appropriately addressed. Through the chilled work environment metrics defined in Attachment 2 and the results of the independent safety culture assessment planned for the summer of 2017, TVA will assess the effectiveness of our actions in promoting and maintaining a sustainable SCWE and a healthy NSC at WBN. As necessary, TVA will continue to update the plan to incorporate changes as a result of ongoing reviews of effectiveness.

Please do not hesitate to contact me if you have any questions regarding this response.

Respectfully,



J. W. Shea  
Vice President, Nuclear Licensing

Enclosure

cc: See Page 4

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Enclosure:

Attachment 1, TVA Chilled Work Environment Action Plan, Revision 1  
Attachment 2, TVA Chilled Work Environment Metrics  
Attachment 3, Commitments

cc (Enclosure):

NRC Regional Administrator - Region II  
NRC Senior Resident Inspector  
NRC Project Manager

ATTACHMENT 1  
TVA CHILLED WORK ENVIRONMENT ACTION PLAN - REVISION 1

**ATTACHMENT 1**

**TVA CHILLED WORK ENVIRONMENT ACTION PLAN - REVISION 1**

**Note: Due Dates are final completion dates for the actions. Many of the actions have commenced and will be noted as on-going in the status column.**

**Safety Over Production**

<b>Item</b>	<b>Action</b>	<b>Due Date</b>	<b>Status</b>
S.1	<u>Develop NSC Outage Actions for U1R14</u> Pre-outage activities <ul style="list-style-type: none"> <li>• Obtain workforce input on appropriate characteristics to assess NSC health during outage periods</li> <li>• Define the specific criteria/ attributes that will be assessed during U1R14 to promote and measure NSC health</li> <li>• Communicate the NSC criteria/attributes that will be assessed during U1R14</li> <li>• Define and communicate outage roles and expectations</li> </ul>	Complete	
S.2	<u>Implement NSC Outage Actions during U1R14 and Unit 2 Condenser Outage</u> Outage activities <ul style="list-style-type: none"> <li>• Outage Observations monitor NSC behaviors                             <ul style="list-style-type: none"> <li>○ Outage-specific observations tools implemented</li> </ul> </li> <li>• Communicate the status of NSC health throughout the outage at Outage Turnover meetings and Plan of the Day meetings</li> <li>• Evaluate the need to adjust the NSC strategy throughout the outage based on any gaps/opportunities identified</li> </ul>	August 4, 2017	on-going
S.3	<u>Assessment of NSC Outage Action following U1R14 and Unit 2 Condenser Outage</u> Post outage activities <ul style="list-style-type: none"> <li>• Communicate NSC performance to the workforce</li> <li>• Obtain workforce feedback/insights on strengths and weaknesses for lessons learned and additional actions needed</li> </ul>	August 4, 2017	

**ATTACHMENT 1**

**TVA CHILLED WORK ENVIRONMENT ACTION PLAN - REVISION 1**

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**Corrective Action Program (CAP) is Effective**

<b>Item</b>	<b>Action</b>	<b>Due Date</b>	<b>Status</b>
CAP.1	<u>Conduct Monthly Pulsing Surveys</u> ECP Personnel will generate a schedule and commence conducting and trending monthly Pulse Surveys of WBN Departments to evaluate: <ul style="list-style-type: none"><li>• Effective use of the Corrective Action/Employee Concerns programs to raise concerns</li><li>• Specific Departments that must be addressed to improve confidence in CAP</li></ul>	December 29, 2017	on-going
CAP.2	<u>Conduct Snapshot Self-Assessment of CAP</u> Conduct snapshot self-assessment of the Management Review Committee and Plant Screening Committee to determine the effectiveness of these bodies	August 1, 2017	
CAP.3	<u>Develop Condition Report Status Reports</u> Provide condition report status reports to WBN departments	Complete	

**ATTACHMENT 1**

**TVA CHILLED WORK ENVIRONMENT ACTION PLAN - REVISION 1**

<i>Item</i>	<i>Action</i>	<i>Due Date</i>	<i>Status</i>
CAP.4	<u>Implement Actions to Drive Improvement in Corrective Action Closure Quality</u> <ul style="list-style-type: none"> <li>• Corrective action closure quality reviews for Level 1 and 2 condition reports are performed in accordance with TVA procedures.</li> <li>• Corrective action closure quality reviews will be performed on a sampling basis for Level 3 condition report actions.</li> </ul>	June 30, 2017	on-going
CAP.5	<u>Form Superintendents Issue Resolution Group</u> Form a Superintendent Leaders Group to address issues raised by the workforce at the site	December 29, 2017	on-going

**Management and Employee Mutual Respect**

<i>Item</i>	<i>Action</i>	<i>Due Date</i>	<i>Status</i>
ME.1	<u>Expand Nuclear Safety Culture Monitoring Panel Participation</u> <ul style="list-style-type: none"> <li>• Encourage participation from workforce personnel including:                             <ul style="list-style-type: none"> <li>○ Nuclear auxiliary unit operators</li> <li>○ Maintenance Craft and technicians</li> <li>○ Chemistry and Radiation Protection technicians</li> </ul> </li> <li>• Establish understanding and alignment of NSC Traits</li> <li>• Obtain workforce input on the assessment of NSC health</li> </ul>	December 29, 2017	on-going
ME.2	<u>Perform a Root Cause Analysis of Weaknesses in the Adverse Employment Action Process Implementation</u> <ul style="list-style-type: none"> <li>• Address results of audit-identified findings</li> <li>• Evaluate organizational and programmatic weaknesses</li> <li>• Generate a performance analysis worksheet (PAW) to evaluate additional training needs, if required</li> </ul>	May 12, 2017	



**ATTACHMENT 1**

**TVA CHILLED WORK ENVIRONMENT ACTION PLAN - REVISION 1**

<b>Item</b>	<b>Action</b>	<b>Due Date</b>	<b>Status</b>
ME.3	<p><u>Evaluate Methods to Predetermine Stressors in the Organization</u></p> <ul style="list-style-type: none"> <li>• Develop and implement an organizational stressor index (OSI) to provide a tool for identifying events or conditions that could introduce undue stress or schedule pressure on the organization.</li> <li>• Communicate results of schedule activity decisions based on insights gained from the OSI tool to station personnel at Site Leadership Team meeting, Plan of the Day and T-week meetings</li> </ul>	Complete	Index is being piloted at WBN
ME.4	<p><u>Conduct Quarterly Audits of the Adverse Action Process *</u></p> <ul style="list-style-type: none"> <li>• Review adverse action documentation</li> <li>• Review executive review board actions</li> <li>• Review effectiveness of Chilled Work Environment Mitigation Plans, when applicable</li> </ul> <p>* interim action until Root Cause completion</p>	December 29, 2017	Begins 2nd quarter CY2017
ME.5	<p><u>Conduct Adverse Action briefings at Site Leadership Meetings *</u></p> <ul style="list-style-type: none"> <li>• Communicate initiation of significant adverse actions and critical thinking for taking the action at the weekly site leadership team meetings</li> </ul> <p>* interim action until Root Cause completion</p>	April 27, 2018	on-going
ME.6	<p><u>Conduct Independent Assessment of WBN Nuclear Safety Culture</u></p> <p>Conduct an independent assessment of the WBN Nuclear Safety Culture using an independent Nuclear Safety Culture Survey and focus groups to evaluate the SCWE and progress made toward achieving a sustainable NSC. Provide analysis of conclusions.</p>	September 29, 2017	

**ATTACHMENT 1**

**TVA CHILLED WORK ENVIRONMENT ACTION PLAN - REVISION 1**

<i>Item</i>	<i>Action</i>	<i>Due Date</i>	<i>Status</i>
ME.7	<p><u>Conduct Operations Pulse Surveys</u>                      ECP will conduct WBN Operations pulse surveys (10% of the staff, every month) that will include questions on:</p> <ul style="list-style-type: none"> <li>• Willingness of operators to raise nuclear safety concerns;</li> <li>• Indications of valuing production over safety;</li> <li>• Indications of undue influence over licensed duties; and</li> <li>• Effective use of the Corrective Action/Employee Concerns programs to raise concerns</li> </ul> <p>These surveys will be evaluated for potential warning signs and missed opportunities to identify safety conscious work environment concerns</p>	December 29, 2017	on-going Moved from C.1.5
ME.8	<p><u>Conduct Pulse Surveys in Additional Departments</u>                      ECP Personnel will generate a schedule and commence conducting and trending monthly Pulse Surveys in select other WBN Departments for period of 12 months</p>	December 29, 2017	on-going Moved from C.1.7
ME.9	<p><u>Site Leadership Interaction (SLT) with Operators</u>                      SLT members will accompany non-licensed operators on rounds periodically to enhance their visibility with the operating crews                      Duty Plant Manager will tour the Main Control Room each week to engage with the operating crews</p>	December 29, 2017	on-going

**ATTACHMENT 1**

**TVA CHILLED WORK ENVIRONMENT ACTION PLAN - REVISION 1**

<b>Nuclear Safety Culture is Understood and Reinforced</b>			
<b>Item</b>	<b>Action</b>	<b>Due Date</b>	<b>Status</b>
NSC.1	<p><u>Conduct Semi-Annual Seminars for Senior Leadership Team</u>                      Conduct semi-annual seminars for the Senior Leadership Team through 2017 focused on:</p> <ul style="list-style-type: none"> <li>• managing and communicating in a changing work environment, and</li> <li>• managing performance expectations without creating a fear of retaliation.</li> </ul>	December 29, 2017	on-going
NSC.2	<p><u>Establish Nuclear Safety Culture Observations at Key Meetings</u></p> <ul style="list-style-type: none"> <li>• Establish and communicate nuclear safety culture observation expectations of key meetings including:                             <ul style="list-style-type: none"> <li>○ Plan of the Day</li> <li>○ T-Week</li> <li>○ Management Review Committee</li> <li>○ Outage</li> </ul> </li> <li>• Conduct monthly trending and communication of observation insights to Site Leadership Team</li> <li>•</li> </ul>	December 29, 2017	on-going
NSC.3	<p><u>Communicate Safety Conscious Work Environment Expectations and Learnings at the Weekly Site Leadership Meeting</u></p> <ul style="list-style-type: none"> <li>• Reinforce Nuclear Safety Culture attributes,</li> <li>• Discuss trends and insights from NSCMP meetings,</li> <li>• Discuss CAP metrics and key accomplishments</li> <li>• Discuss adverse actions, as applicable</li> </ul>	April 27, 2018	on-going

**ATTACHMENT 1**

**TVA CHILLED WORK ENVIRONMENT ACTION PLAN - REVISION 1**

<b>Item</b>	<b>Action</b>	<b>Due Date</b>	<b>Status</b>
NSC.4	<p><u>Conduct TVA Nuclear Senior Management Review of WBN NSC</u>            Conduct monthly oversight of WBN Chilled Work Environment Action Plan to assess:</p> <ul style="list-style-type: none"> <li>• Progress against plan deliverables</li> <li>• Effectiveness of actions taken</li> <li>• Need for additional actions</li> </ul>	June 30, 2017	on-going
NSC.5	<p><u>Conduct Safety Conscious Work Environment Refresher Training</u></p> <ul style="list-style-type: none"> <li>• Conduct computer based training (CBT) for all Watts Bar Nuclear Plant personnel including contractors</li> </ul>	August 31, 2017	
NSC.6	<p><u>Conduct a Seminar for Site Supervision</u></p> <ul style="list-style-type: none"> <li>• Conduct a seminar for site supervisory personnel on establishing the vision and expectations for managing and communicating in a changing work environment.</li> </ul>	December 29, 2017	on-going
NSC.7	<p><u>Implement Corrective Action Program (CAP) Information Sharing</u></p> <ul style="list-style-type: none"> <li>• Implement CAP seminars for targeted departments</li> <li>• Provide CAP tutorials for requesting departments</li> </ul>	December 29, 2017	on-going
NSC.8	<p><u>Establish a Fleet Safety Culture Peer Team</u>            Establish a Fleet Safety Culture Peer Team to monitor and discuss the health of the sites' safety culture and safety conscious work environment</p>	July 21, 2017	

**ATTACHMENT 1**

**TVA CHILLED WORK ENVIRONMENT ACTION PLAN - REVISION 1**

<b>Item</b>	<b>Action</b>	<b>Due Date</b>	<b>Status</b>
NSC.9	<p><u>Establish an experienced Executive Safety Culture Advisor role</u> TVA will procure an experienced executive to perform, review and observe activities at TVA sites and provide feedback, coaching and recommendations to the TVA leadership team on achieving sustainable improvement in safety culture at the sites.</p> <ul style="list-style-type: none"><li>• Conduct leadership observations of key nuclear leadership engagements</li><li>• Provide oversight of the newly developed safety culture peer team</li><li>• Assess effectiveness of the existing safety culture and SCWE mechanisms including the ECP, CAP, NSCMP and NSRB</li></ul>	May 31, 2018	
NSC.10	<p><u>Revise Nuclear Safety Oversight Guidance</u> Implement new requirement in Nuclear Safety Oversight procedure to include standard agenda requirement for periodic independent observations and selective interviews to gain NSC insights</p>	Complete	

## ATTACHMENT 2

### **TVA CHILLED WORK ENVIRONMENT METRICS**

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#### Safety has priority over production:

- Pulse Survey Results
- Nuclear Safety Monitoring Panel Results
- Organization Stressor Index
- Independent Survey Results

#### CAP is effective:

- Operational Focus Aggregate Impact Metric Corrective Action Closure Quality and Timeliness
- Pulse Survey Results
- Corrective Maintenance Backlog
  - Safety Work Orders
  - Critical Component CC/DCs
  - Priority 1 and 2
- Number of Condition Reports compared to other Utilities

#### Management and employee mutual respect:

- Employee Concerns Metric - Management/Personnel Issues
- Focus Group Results
- Pulse Survey Results
- Nuclear Safety Review Board
- Executive Review Board
- Independent Survey Results

#### NSC is understood and reinforced:

- Observation Program (ePop) Trending
- Nuclear Safety Monitoring Panel Results
- Focus Group Results
- Independent Survey Results

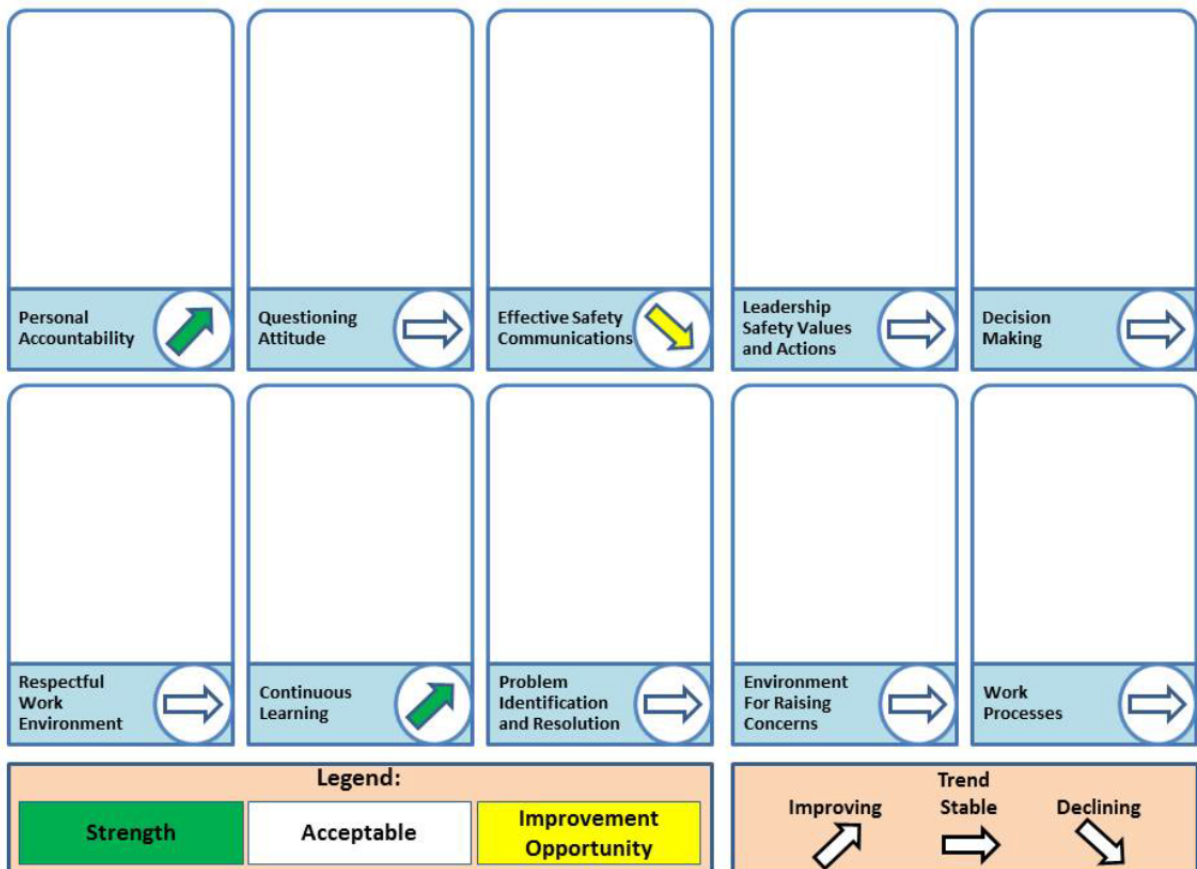
## ATTACHMENT 2

### TVA CHILLED WORK ENVIRONMENT METRICS

#### Definitions

1. **Pulsing** - A survey/interview activity performed by the ECP with employees to aid in understanding and monitoring the General Work Environment and/or the Safety Conscious Work Environment (SCWE).
2. **Nuclear Safety Monitoring Panel Results** - Performance Trends in Nuclear Safety Culture Traits makeup the NSC Dashboard (Below as example only). This dashboard summarizes and reflects the overarching condition of NSC based on the roll up and evaluated input from the NSCMPs. It is designed to provide one page visual performance trend display of the health of Nuclear Safety Culture for evaluated period depicted.

#### Nuclear Safety Culture Traits



3. **Operational Stressor Index** - a tool developed to detect and address stressors. The tool features-
  - A list of potential stressors,
  - Means of categorizing based on potential impact on employee willingness to speak up
  - Requirement for management to implement actions for stressors with significant risk to SCWE
  - Review with Director of Plant Support and Site Management on a monthly basis
  - Review with Chief Nuclear Officer on a quarterly basis

## ATTACHMENT 2

### TVA CHILLED WORK ENVIRONMENT METRICS

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4. **Independent Survey Results** - the purpose of this survey is to measure the attitudes and perceptions of the workforce about nuclear safety culture at Watts Bar. The survey will be conducted by an independent third party vendor.
5. **Operational Focus Aggregate Impact Metric** - a measure of the overall impact to the Operating Staff of key indicators.
6. **Corrective Maintenance Backlog** - The number and age of existing CC/DC backlog Work Orders is trending downward, especially with regard to WO's with Operations and CAP focus codes. In addition:
  - o Safety Work Orders ( $\leq 5$  I1/I2 and I3 trending downward)
  - o Critical Component DCs (Trending downwards)
  - o Priority 1 and 2 (Zero outstanding Priority 1 WO's and Priority 2 WO's  $\leq$ )
7. **Closure Quality:** Corrective Action closure quality and timeliness come from the Performance Improvement Health Monitor and is based upon the following:
  - a. Measures requirements from NPG-SPP-22.300 (CAP) against actions taken in Maximo.
8. **CAP Timeliness:**
  - a. CAP Development for Level 1 and Level 2 analysis and action timeliness meet the procedural requirements of NPG-SPP-22.300
9. **CR Initiation:** CR Initiation numbers comparable (+/- 500) to other stations in the fleet. (Normalized)



**ATTACHMENT 3**

**COMMITMENTS**

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1. TVA will conduct an Independent Safety Conscious Work Environment Assessment at Watts Bar Nuclear Plant by September 1, 2017.