



# INNOVATIVE ON-LINE COOLING TOWER WORK

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# MISSION

Develop and implement a safe and innovative solution to expedite long-range efficiency repairs for Fermi 2's Natural Draft Cooling Towers.

Implement a Continuous Improvement model to eliminate Outage work and establish an "On Line" strategy.

Isolate specific location and target repairs in a Safe and Workable environment.

# INNOVATION

- Developed an alternative process that challenges the way things have always been done in the past.
- Implement a innovative and superior process to support the main cooling tower maintenance activities while the plant is online.
- Develop a diversion system to dam off sections of the hot water basin and flume, thus isolating the flow of water to targeted work areas.



# SAFETY



The biggest advantages from utilizing this innovation is the removal of time constraints associated with plant outages, thus improving the overall Safety of the process.

Maintenance projects can be scheduled as part of a normal workweek eliminating the error traps of turnover, worker fatigue, and time pressure.

Have the ability to select prime weather conditions to perform cooling tower work helps enhance the safety of all craft personnel.

Journeymen are no longer subject to harsh cold weather conditions that may result in injury.

The core team performing this work were able to complete this project by working regular, 40-hour work weeks, thus eliminating possible injuries resulting from overtime fatigue.

# COST SAVING

- The ability to improve the efficiency of the repairs allows the site to benefit long-term from all gains associated with this maintenance strategy.
- Enhanced the capability of the cooling towers and increased gross megawatt output by 4 to 6 MWE during the summer.
- Being able to capitalize on these gains instantly allows for greater returns and compiled savings over the life of the unit.
- Reduction of man hours as majority of the outage budgets were spent in efforts to combat harsh weather conditions



# PRODUCTIVITY/ EFFICIENCY

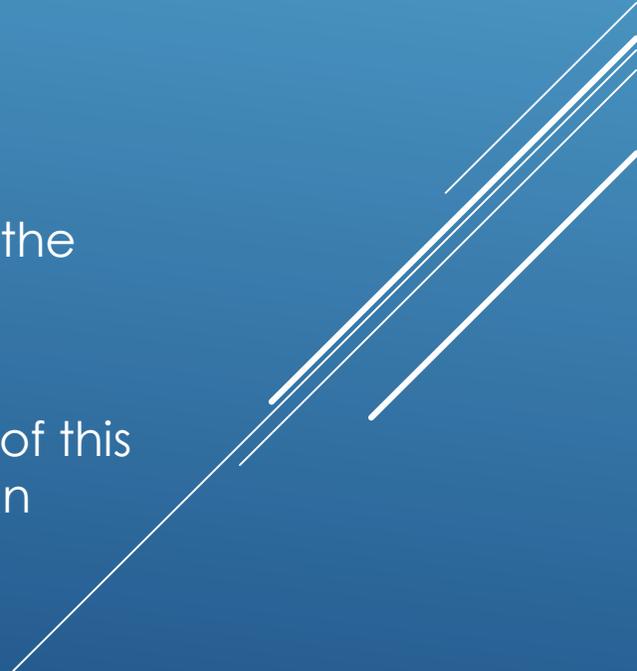
On Line work has been greatly increased with the reduction of man hours, and by reducing the core team by 1 worker.

Continuous Improvement tools were applied to immediately recognize the efficiencies of reduction in material handling, extraction of debris and improved rigging capabilities.

Applied efficiencies to each repair section identified as well as innovative concrete handling and equipment reliability.

Expedited maintenance schedule that provided immediate efficiencies to repair process for natural draft cooling towers.

# COMMUNICATIONS

- This entire project started with one question:
    - Is there a better way to support the cooling towers; and how can we add efficiencies to service work between refuel outages?
  - Improved the overall relationship between DTE Energy's and Mid-American Group's management team was a vital in the process that moved this project forward.
  - Implemented a Team work concept with Operations, Maintenance, Engineering to drafted a preliminary design.
  - Through Engineering evaluation and Senior Leadership support, the size of the water diversion area was precisely tuned to support maximum workability without impacting plant operation.
  - All parties practiced effective communication skills to verbalize each step of this design to those who were approving or executing this innovative change in online cooling tower maintenance.
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# VISION & LEADERSHIP

DTE Energy's and Mid-American Group's constant quest for improvement to quality was the driving force for this innovation

DTE Energy and Mid-American Group leaders looked at the cooling tower cross flow issue as a challenge to be solved rather than accepted "Status Quo".

Each member Organization and Senior Leadership teams worked to make this a viable process.

The strong partnership solidified the success of this innovative process that will continue to deliver benefits in safety, plant efficiency and cost savings.

