

BE KIND REWIND

Sometimes you really can't fix it!

IRMC

June 28, 2023

Houston, TX



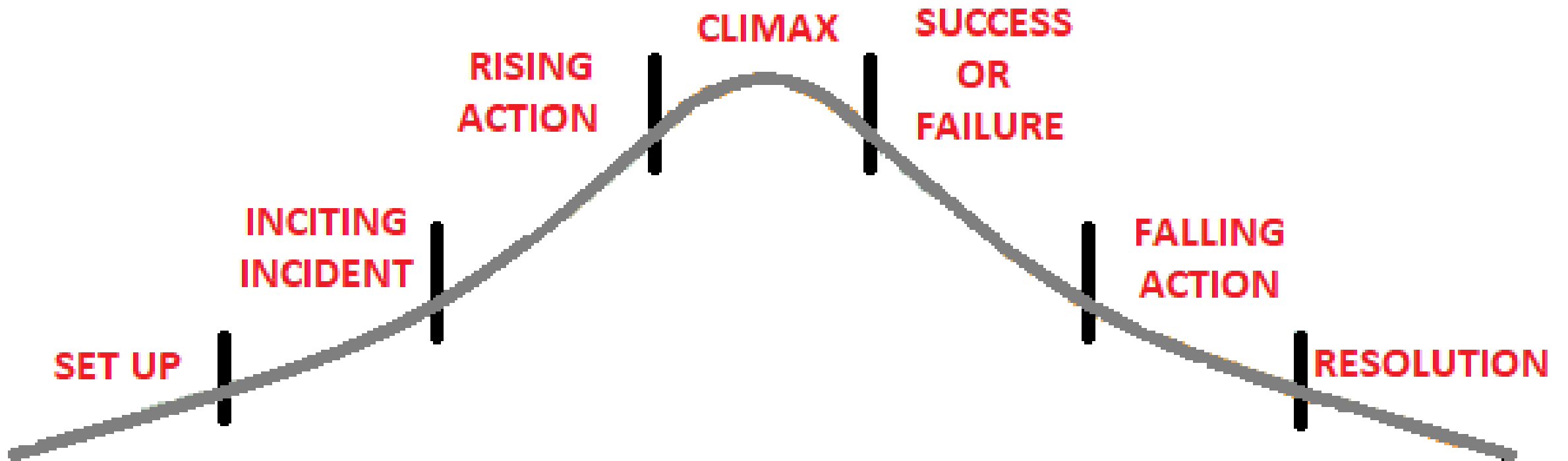
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STORY ARC

- Synopsis: We attempted a repair and ended up rewinding.



SET UP

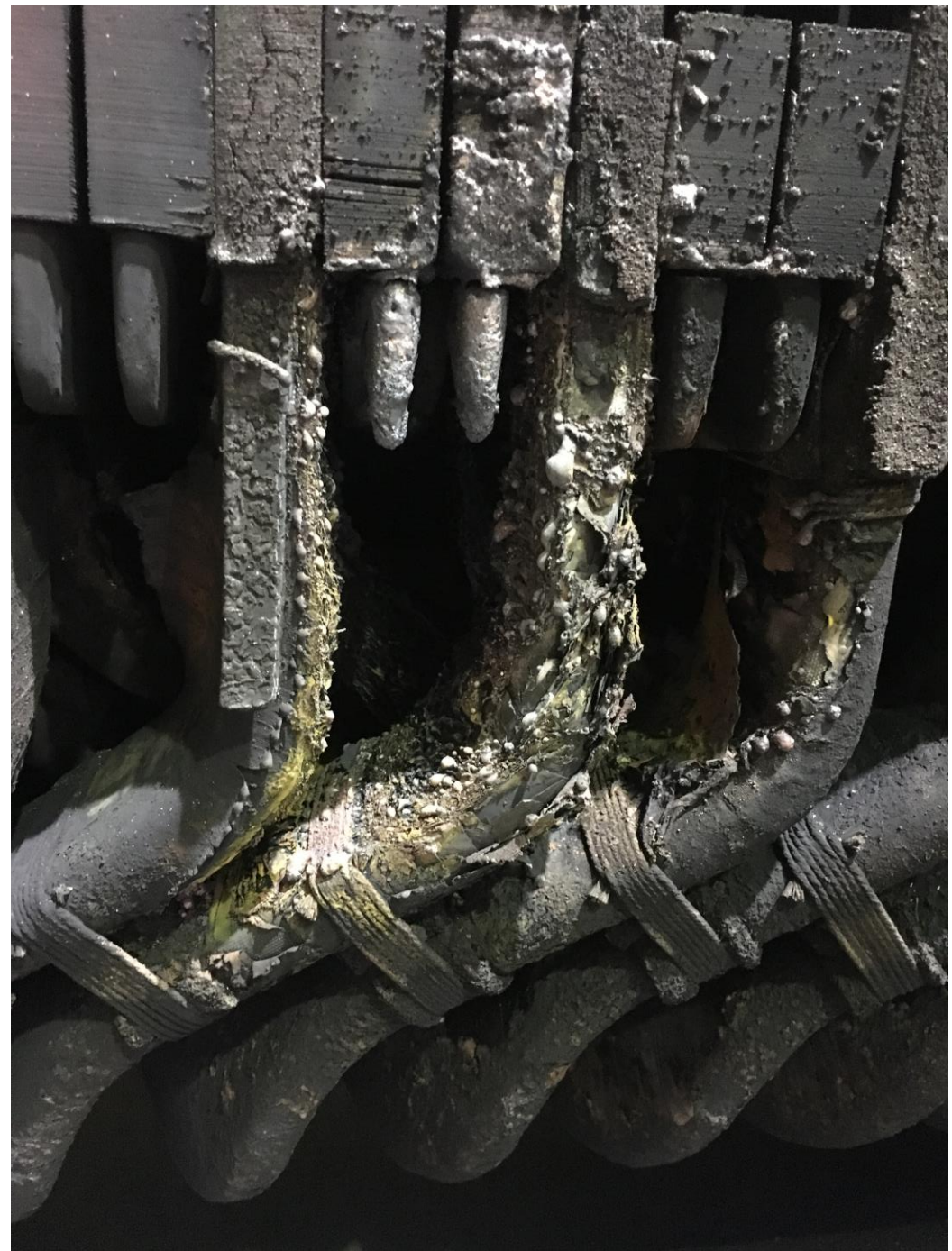
- Two sister unit plant
- Approx. 59 MVA each
- Multi-turn coils
- Original early 1960s construction
- No history of failures





INCITING INCIDENT

- Late Summer 2016
- Generator differential trip on start-up of Unit 2
- Fault between A and B phases
- 64G relay did not trip due to a loose wire
- Visual inspection found failure near slots 1 and 2





RISING ACTION

- Plant staff attempted to isolate failed coils
- Could not clear both phases
- Removed the rotor
- Found second failure location near slot 165!
- No money for a rewind
- Developed a repair plan:
 - 1 coil bypass
 - 2 full coil replacements
 - 5 half coil splices
 - Rewedge unit
- Repair would leave few spares



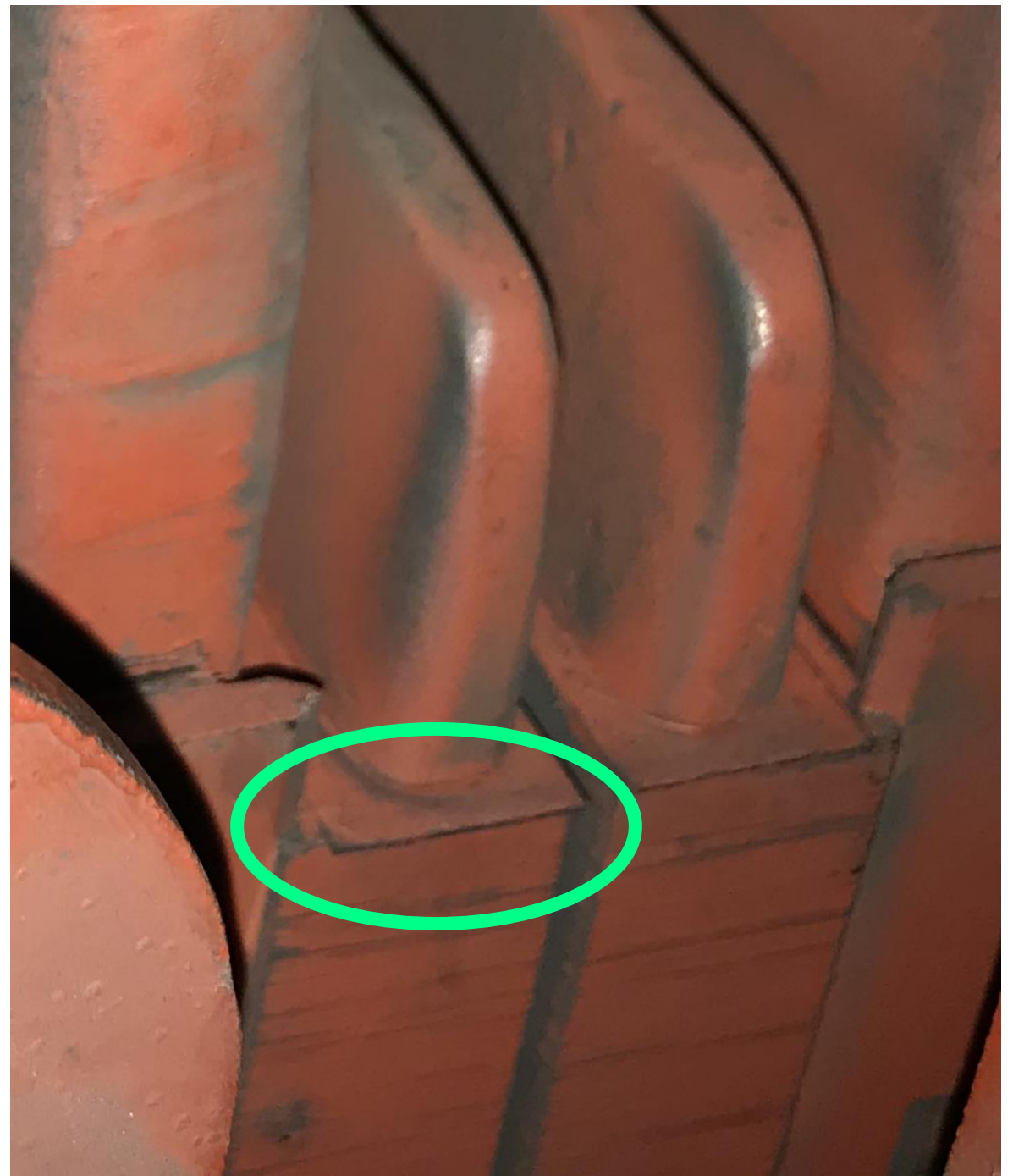


- Awarded repair contract 2 years later
- Refined repair plan
- Identified need for additional coils
- Cleaning and testing
- Thorough unit inspection...



(SUCCESS OR) FAILURE

- Contractor's inspection revealed widespread issue with the top core lamination
- "Heavy" lamination had migrated toward the bottom coils
- Affecting 30-50% of slots
- Likely cause of the slot 165 failure
- Unit 1 had the same issue
- Could not proceed with repair
- Contractor was very helpful!






FALLING ACTION

- Developed and resolicit to rewind both units
- Awarded another 3 years later
- Replacing both winding and core
- Resolution still in progress







WHAT HAVE WE LEARNED?




What have we learned, Palmer?



[Palmer: I don't know, sir]



I don't know either



I guess we learned
not to do that again

MORAL OF THE STORY

- Making the right decision from the beginning can save time and money.
 - Try not to let money block the right decision
 - Gather all necessary info
 - Make sure your investigation is thorough
 - Know your organization's limits



THANK YOU!

Questions?

