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Who Determines a Quality Plastic Pipe Fusion and How is it Done?

Agenda

- Fusion Quality Defense Layers at installation
- Overall QA/QC Fusion Quality Defense Layers
- Future State

Con Ed Pipe joining Defense Layers at installation

- 3 layers of defense to ensuring a quality joint
  - First is the mechanic who make the joint
    - The fully qualified mechanic is the first and most important part of process
      - Expected to strictly follow all joining procedures and then they perform a visual inspection
  - Second is our independent second level inspection
    - 100% of fuses are reviewed by a non crew based inspector who is qualified in visual inspection
  - Third is the QA/QC group checks
    - ~5%(5000k) fuses are inspected by the QC group. The majority of these inspections are a review of the entire process of fusing rather then just a visual inspection. All inspectors are fully fusion qualified

Overall Fusion Quality Layers

- ***Plastic Fusion, Second Inspections:*** 100% of all newly installed plastic fuses are inspected by independent non crew based inspectors
- ***Construction Inspections:*** Plastic fusion installation work is reviewed for overall construction compliance through periodic inspections
- ***Hold Point Inspections:*** Field Inspectors perform a pre-backfill Hold Point Inspection.
- ***QA/QC Field Inspections:*** QA/QC Inspectors (Company employees and third party contractors) perform plastic fusion inspections, **above and beyond the Second Inspector requirement**. The majority of these inspections are full process inspections not just visual. **To date ~3000 fuse inspections done this year**

Fusion Quality Layers

- ***Re-dig Inspections:*** Company employee QA/QC Inspectors will perform re-dig excavations on recently completed construction projects. (43 target for 2020)
    - **These digs target overall construction quality i.e. backfill, marker balls, tracer wire clearances etc...**
- ***Operator Qualification Targeted Reviews:*** Con Edison has developed a database report to compare 100% of all fuse information against Operator Qualification records in order to determine if any fusers or Second Inspectors performed a fuse or inspection, as applicable, while not qualified to do so.

Fusion Quality Layers

- ***Normal Course of Business Exposed Fuses:*** All fuses exposed during the normal course of business are visually inspected
- **Monthly Leak Survey :** entire system is checked for leaks monthly during a mobile leak survey inspection

Con Ed Pipe joining Defense Layers
Failure analysis

- Any plastic pipe failure that is noted in the field is brought into Con Edison's Gas Lab department and analyzed to determine root cause of the failure.
  - Any relevant information from these is then shared throughout the company to ensure we do not have repeat instances of failures

Future State

- R&D effort to create a laser scan device to determine if joint meets all visual acceptance criteria
  - Try to make the process more objective
  - Reduce risk