FOLDTRACK MOBILE RETRIEVAL TOOL EXPERIENCE

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Presentation Agenda

- Introduction/Background
- Design Features
- Design Modifications
- Testing of the FoldTrack
- Operation of the FoldTrack
- Lesson Learned
- Path Forward
- Q & A

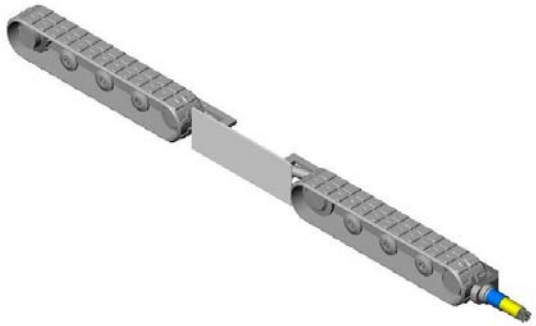
Introduction/Background

- Prototype unit reverse engineered in UK
- Demonstration unit shipped to Hanford in late 2005 to the Cold Test Facility
- Demonstration showed promise, as well as revealed several design flaws
- Unit was shipped back to UK
- Decision was made to order production unit in late 2006 to support C Farm residual heel retrievals

Original Factory Proof of Principle Unit

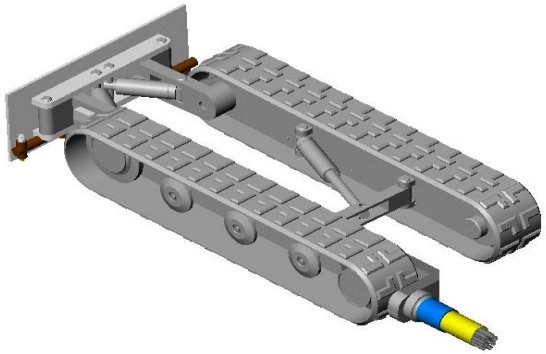
- **The NESL FT-12-CS is a folding track system designed for vertical entry into tanks with limited manway or riser size.**
- **The unit can be inserted by crane or winch and is powered by a NESL Hydraulic Power Pack and control system. The unit comes as standard with**
- **-150 Foot Umbilical**
- **-Pusher Blade**
- **Twin 10,000 PSI jetting bars**

- **The Unit can be deployed through a 12 Inch Manway or riser**
- **And remotely energized into Closed (working) Mode.**



INSERTION (DEPLOYMENT) MODE

TRANSITION MODE



CLOSED (WORKING) MODE

Original Factory Proof of Principle

DEMONSTRATION TEST AT COLD TEST FACILITY in 2006, 2007

First Production Unit

FIRST PRODUCTION UNIT

Design Features

- Stainless Steel construction – weight ~800 pounds
- All hydraulic drive – no electrical or onboard instrumentation
- Contains Pusher Blade and two jet spray systems (up to 5000 psig)
- Deployable through a Schedule 40, 12-inch pipe
- In working mode measures ~ 30’ wide and 66 inches long
- Can push its own weight of product the full diameter of the tank (75 feet)
- Tracked feature allows for navigation of rough topography
- Very high tipping moment (~89 degrees)

Design Features

SCARIFIER MANIFOLD

Design Features

JETTING CANNON

Design Modifications Required

- Drive train design modified for internal close coupled drive motors (demo testing revealed weakness in previous drive motor coupling shaft design)
- Bronze bushings replaced with more chemically tolerant polymer
- Track channel guide requires waste cleaning design (the FoldTrack threw a track early into the Tank 241-C-109 residual heel retrieval – the track drive channel could not clear itself when operated in dry powdery waste)
- Jetting/scarifying pressures will be increased from ~2000 psig to 5000 psig (the waste product in Tank C-109 contained cobble much harder than previously anticipated – recent testing demonstrated that 5000 psig will be effective)

Testing of the FoldTrack

- In addition to Factory testing, very extensive testing and operator training was performed over the course of 4 months on the FoldTrack
- Simulants and debris were of challenging makeup
- All testing was performed in a wet environment based upon the assumption that Tank C-109 waste would be very wetted by sluicing operation, as well as by the FoldTrack jetting systems
- The results of this testing were impressive
- No failures occurred during testing
- Based upon the multiple phases of testing (factory proof of principle, demonstration and qualification) and lessons learned, the FoldTrack was successfully qualified to be field deployed

Testing of the FoldTrack

FoldTrack in Deployment Mode

Testing of the FoldTrack

Testing of the FoldTrack

UK Patent Application No. 0718573.9

FoldTrack in Landing Mode

Testing of the FoldTrack

Testing of the FoldTrack

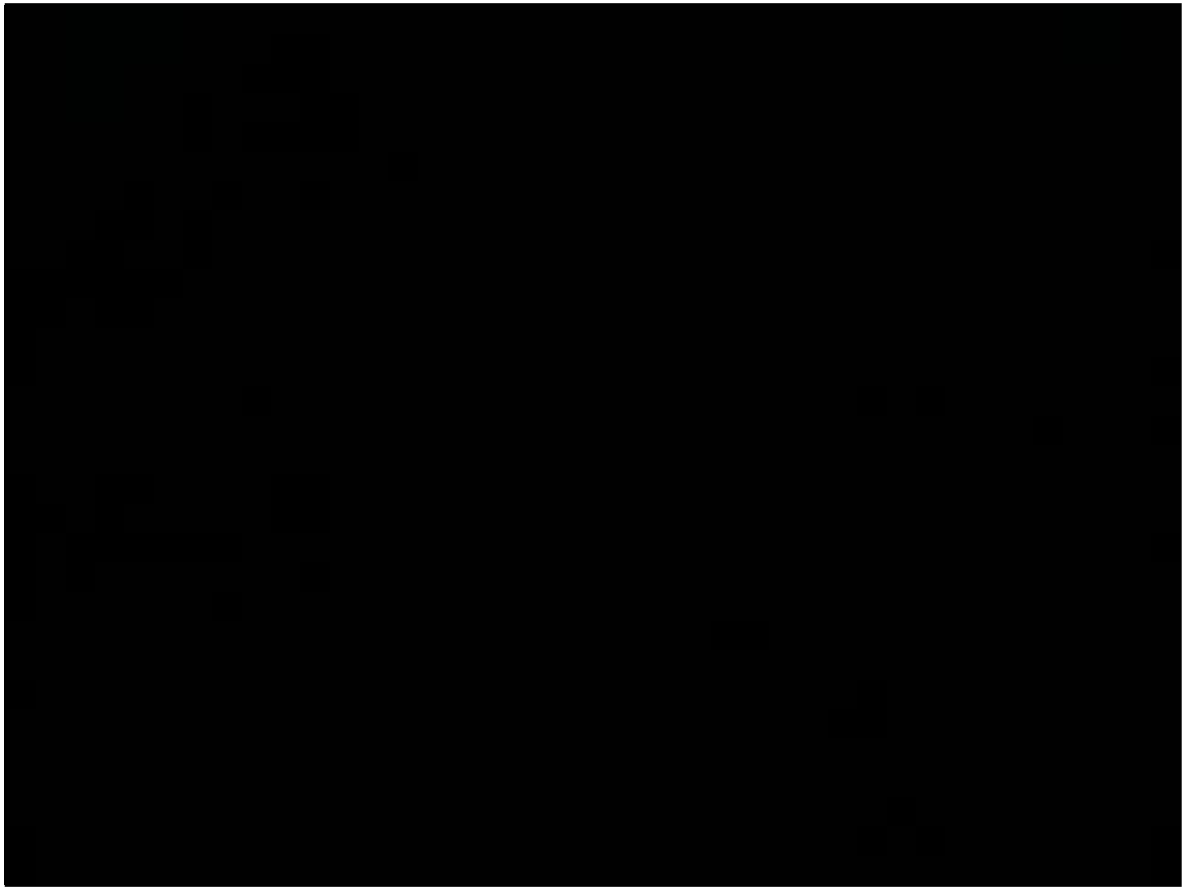
Testing of the FoldTrack

- A question was raised prior to installation regarding the ability of the FoldTrack to fit through the riser opening
- Various methods of proving that it would were tried, but the methods chosen proved to be unreliable
- After several months of failing to prove that the unit would fit, an approach was arrived at that provided confidence that it would
- The FoldTrack was successfully installed and prepared for operation

Testing of the FoldTrack

- The FoldTrack began operation in late spring of 2008
- The system worked well for two shifts before it threw a track during operation in C-109
- Because of the levels of contamination, it was not considered safe to try retrieving the unit for repair
- Attempts to continue to use the unit with just one remaining track proved to be arduous and provided little value
- Because of the unconventional operation of the one tracked unit, a hydraulic cylinder seal failed and use of the FoldTrack was discontinued shortly thereafter

Operation of the FoldTrack



Click on Video Above to Play

FOLDTRACK OPERATING IN TANK C-109

Lesson Learned

Whenever stepping outside of normal process or manufacturer's recommended process operation, an impact evaluation should be performed.

The FoldTrack activity is a perfect example in which circumstances seemingly unrelated to each other, can combine to cause unforeseen events. In the case of the FoldTrack, the C-Farm water skid was down for repair, precluding the use of the onboard water jetting systems, and it was decided to not sluice the day of the failure. This was not evaluated and perhaps the loss of the track could have been avoided.

Lessons Learned

It was decided to operate the FoldTrack to stage waste on the side of the tank that hadn't been wetted by previous sluicing activities. The unit was operated in dry powdery waste for ~ 45 minutes when the one of the tracks slipped off.

It was evaluated that the dry waste was compacted within the track channel guide to the extent that the relief holes would no longer pass the waste out of the guide. This resulted in compression of the track spring tensioner over a short time, allowing the track to clear the drive sprocket and slip off.

DISABLED FOLDTRACK

Path Forward

Based upon positive testing and operational results, as well as the viability of required modifications, Washington River Protection Solutions is currently pursuing a Baseline Change Request to procure, test and apply a modified FoldTrack for waste heel retrieval activities.

Lessons learned modifications will be incorporated into the FoldTrack if/when the BCR is approved.