

26th World Gas Conference

1 – 5 June 2015, Paris, France



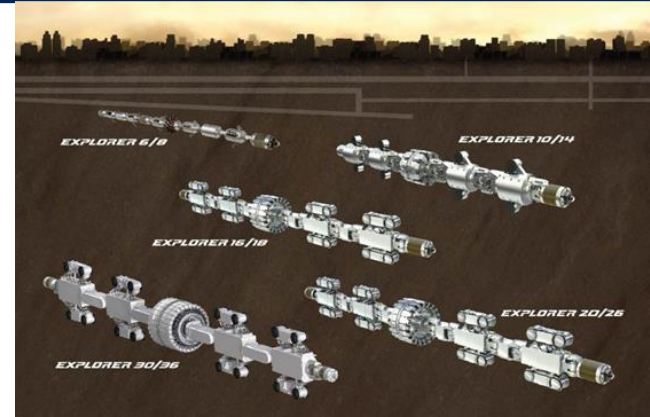
DEPLOYMENT OF SENSOR TECHNOLOGIES AND
SUPPORTING SYSTEMS FOR ENHANCEMENT OF
COMMERCIAL EXPLORER™

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Vice President, RD &D, Northeast Gas Association



Commercial Platform Products

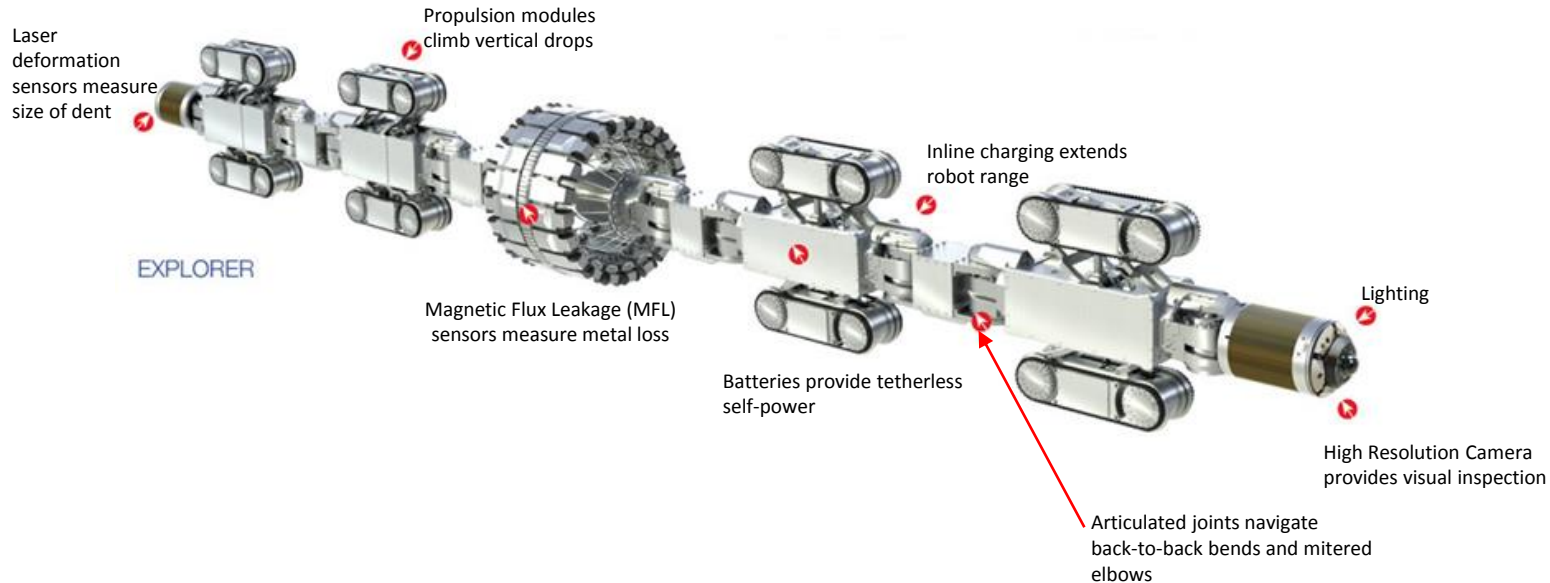
- Modular, self-powered, non-tethered & measuring metal loss
- Battery powered; wireless communication; remotely controlled
- Live launching, operation and retrieval
- Can negotiate short radius and mitered bends, plug valves ($\geq 20''$), back to back bends, vertical segments



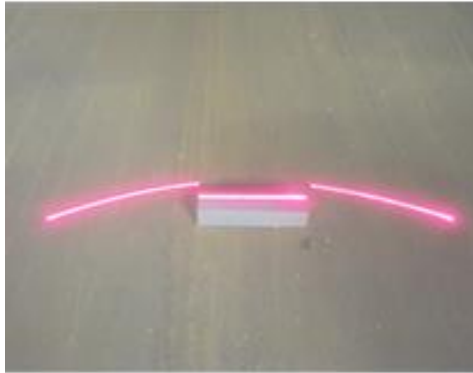
Industry Sponsors*	Federal Sponsors
NYSEARCH/NGA (12 members)	PHMSA/DOT
Operations Tech Dev't, NFP	SDTC Canada with Invodane Engineering
PRCI	DOE

*in-kind by other gas companies

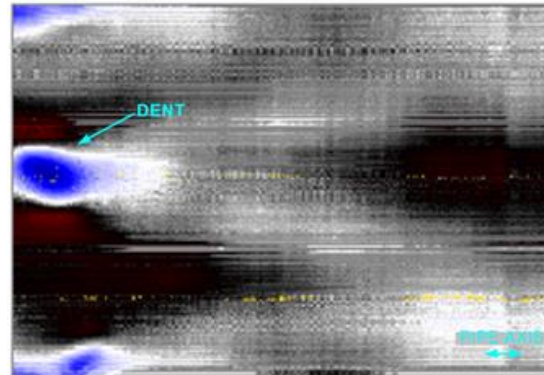
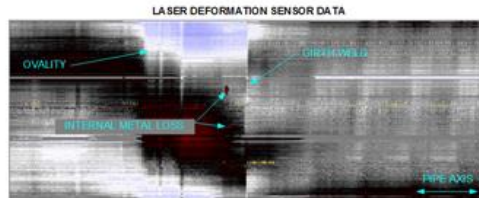
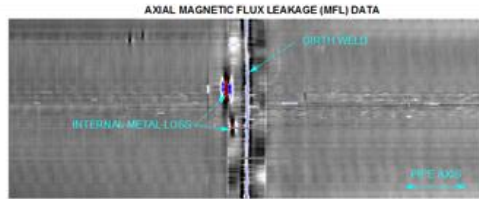
Features of Explorer Series of Products



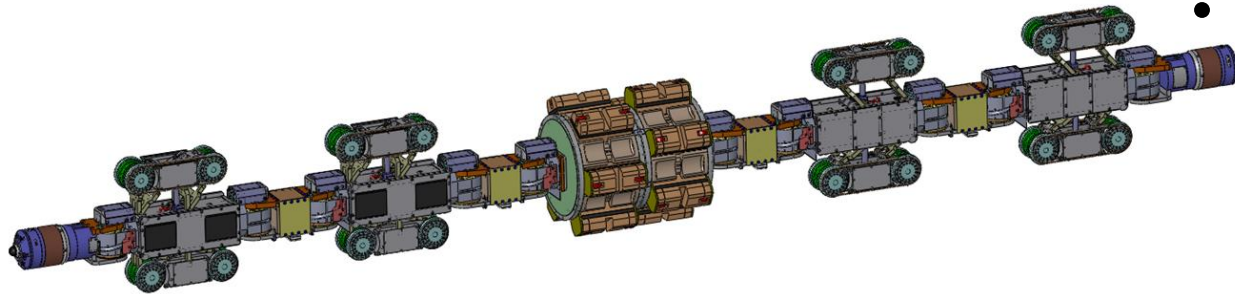
Completed/Commercial Supporting Technologies



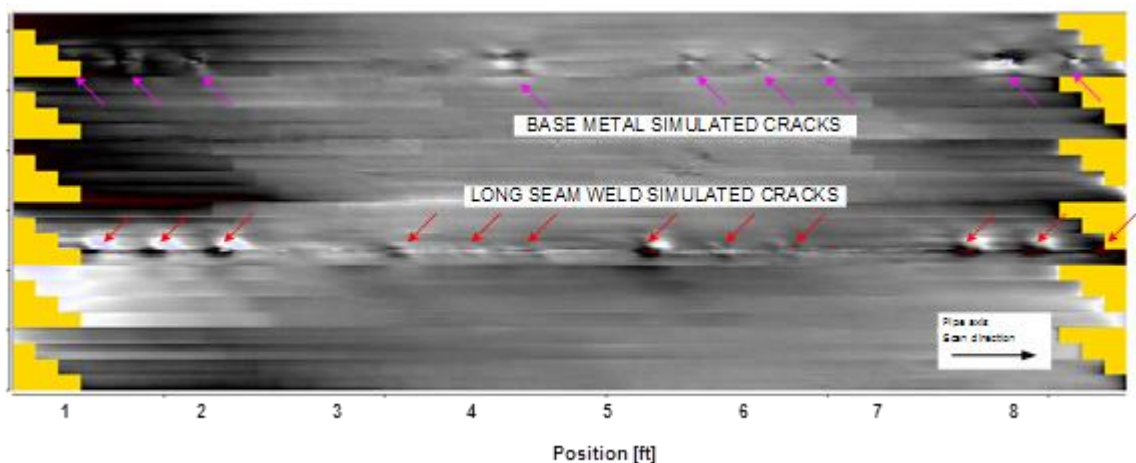
- Mechanical Damage /Ovality Sensor
- In Line Charging
- Rescue Tool



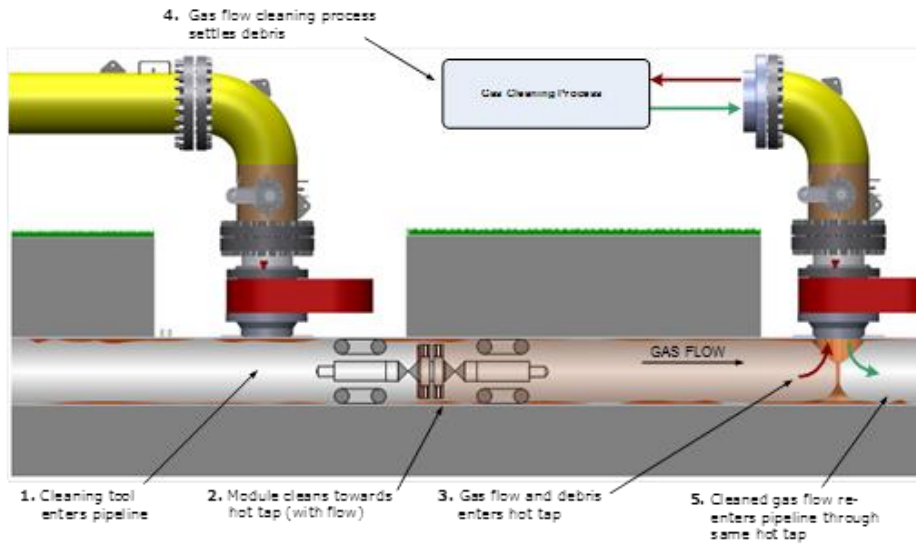
Supporting Techs Under Devt – Crack Sensor



- A combination TMFL/EMAT sensor was selected
- Inherent large size and weight of TMFL a major challenge
- One module for all crack sensing



Supporting Techs Under Dev't – Cleaning Tool



- Special cleaning head
- Cleaning tool launcher attached to off-the-shelf fitting and valve
- Launcher purged with nitrogen
- Sleeve to protect the valve
- 2nd fitting required for separation of debris; recirculation of clean gas

Supporting Techs Under Devt – Hardness Tester

- In live conditions, prepare surface (removal of at least 0.01”) to eliminate surface decarburization
- Using proper indenter, apply increasingly higher loads (with partial unloading in-between) on pipeline surface to generate indents
- Depth of indents used to measure hardness that correlate to yield strength
- Ten measurements needed per point for statistical accuracy

Overall Summary of Supporting Technologies Results

- Implementation of LDS sensor, crack sensor, in line inspection, cleaning tool and hardness tester adds functionality and improves operational efficiencies
- N. American gas industry has welcomed and implemented these solutions for inspection of unpiggable pipe
- What was unpiggable is now 'robotical'