MAKING A DIGITAL DIFFERENCE

Ryan Streeter, MISTRAS Group, USA, introduces modern approaches to inspection reporting in the downstream sector.

> efineries and other process plants rely heavily on the ability to process and deliver critical non-destructive examination (NDE) inspection reports to keep the facilities safe, operational, and profitable. But what happens when that information is not appropriately processed, organised, and delivered? Traditional, paper-based inspection reports are notoriously inefficient, and can lead to costly maintenance delays, manual errors, safety concerns,

and lost profits.

While this may sound like an intimidating task to overcome, there are solutions. Mobile digital reporting solutions now exist that transition away from paper-based reporting. Powerful, end-to-end workflow solutions enable increased safety and significantly enhanced productivity through the elimination of non-value-added work, while offering customers complete visibility and transparency into the inspection process. All NDE operations results are centralised, while the process to request NDE, forecast schedules, assign technician/inspector tasks, execute field work, review results, publish reports, and generate key performance indicators (KPIs) is simplified and connected.

Digitalisation vs traditional NDE reporting

While traditional, paper-based NDE reporting has served its purpose over the years, the world today moves at a faster pace, requiring data to be delivered quicker and more accurately than ever before.



Figure 1. Plant managers have instant access to critical inspection reports and can plan accordingly based on the priority needs of their refinery/process plant.



Figure 2. Through MISTRAS Digital, technicians/inspectors can report NDE results to a plant's inspection database management system (IDMS) instantly and seamlessly.

MISTRAS Digital is a next-generation, NDE reporting solution that helps facility operators and personnel streamline critical data, facilitate operations, oversee safety, and coordinate budgets into functional, easily accessible categories. Through this process, customers are given the opportunity to experience enhanced NDE reporting, by way of upgraded visibility, flexibility, control, and optimisation, along with specific time and cost efficiencies.

The use of digital reporting solutions rather than traditional, paper-based reporting offers many useful capabilities that help to streamline refinery operations.

Facility personnel can remotely plan, schedule, dispatch and receive inspection tasks at their convenience, whereas through traditional reporting, each of these steps has to be completed manually and requires face-to-face intervention, which can be time-intensive and potentially lead to human error. By utilising a digital reporting solution, NDE technicians/inspectors also have access to all relevant data and documentation on their mobile devices (e.g. isometric drawings, weld maps, P&IDs, UI's, pipe schedules, inspection histories, etc.), enhancing the inspection process.

The tablets' cameras offer the ability to quickly capture and embed field photos directly within the inspection record. The technicians/inspectors' pertinent data is also captured during field execution and encrypted along with the inspection record to ensure data integrity. If any questions or concerns arise while the technician/inspector is in the field, audio and video communications can be engaged between site management and the field technician/inspector for real-time collaboration. Customers also have the capability to bake-in custom logic geared to drive dynamic work instructions and deliver custom formats for inspection report deliverables.

A mobile reporting platform can seamlessly integrate within many inspection data management systems (IDMS), such as MISTRAS' Plant Condition Management Software (PCMS), enabling further efficiency gains through the direct download and upload of data to the customer's system of record. It successfully addresses the need for a variety of working situations including turnarounds, run and maintain projects, capital project, or call-out NDE and is fully compatible with iOS, Android, or Windows-based platforms. Mobile reporting platforms can also address all connectivity scenarios, including 4G, LTE, and offline protocols, with periodic synchronisation to the server.

Safety oversight

Safety is maximised through the implementation of engineering controls within field workflows, and 'start work authority' is governed by the platform's database. This action prevents technicians/inspectors from starting work without having a list of specific requirements met. This includes proper and extensive



training, possessing all active and relevant certifications, ensuring that current equipment calibrations are not expired, having successfully completed a job safety analysis (JSA) and job hazard analysis (JHA), and any other prerequisites required by the customer. Once all these preconditions are satisfied, then a start work authority will be granted.

Time and cost efficiencies

When it comes to providing inspection reports and other relevant field data, traditional, paper-based techniques introduce significant latency between the work being completed and the actual handover of the deliverable. Manual data entry from multiple technicians/inspectors can also lead to significant discrepancies in inspection results, potentially resulting in incorrect reporting or redispatch of technicians/inspectors to perform verification work.

However, with a comprehensive digital solution like MISTRAS Digital, reports are standardised, accurate, and provided instantaneously, leading to conservative expectations of 10 – 15% gains in productivity just in the field alone. These inspection reports are standardised and authored automatically, based on the information captured in the field, which helps to deliver a consistent product. It also maximises data integrity and eliminates hours of non-value-added work. If management personnel have questions about specific inspection results, they can communicate instantaneously with the on-site technicians/inspectors to confirm accuracy, rather than sending them back to the site days or weeks later. A centralised database enables KPIs to be generated in real-time and rendered in a web portal to maximise process transparency. Certain metrics, such as progress, productivity, cost, and efficiency, are provided out-of-the-box to help drive business decisions, while flexible digital platforms enable additional custom KPIs to be developed in minimal turnaround time.

Digital reporting solutions offer real-time system advantages, including delay notifications, facility access, permitting, and weather conditions. When implementing a digital reporting solution into a workflow, refinery personnel are set to experience an increase in data reliability, reduced manual data entry, real-time feedback from the field, and remote data analysis.

Making the case for digital reporting

In multiple cases during 2019, MISTRAS Digital successfully enabled increased efficiency across a multitude of tasks:

- Eliminated the need for spreadsheets and worklogs to be built: query from IDMS and upload CML scope into the portal.
- Increased efficiency for coordinators: provided added engagement in the field with technicians/inspectors.
- Eliminated the need to carry paper: all drawings and IDMS historical data was readily available to technicians/inspectors on their tablet.
- Eliminated the need to retype reports in the office: inspection reports were generated in the field rather than in the office.
- Reduced verification work by requiring a recheck while still in the field: UT Temp conversions and

feedback for thickness anomalies during field data entry.

- Eliminated the need to carry a digital camera and manually manage pictures: view and download high-quality field photos and attachments from portal.
- Reduced the latency between dispatch and receiving inspection results: live update of incoming inspection data in portal per asset.
- Eliminated the need for manual data entry: inspection data was loaded directly into the IDMS (following QA/QC review).

Final thoughts

Long gone are the days when utilising manual, paper-based reporting methods for NDE and visual inspection were ideal. Mobile reporting platforms have modernised the inspection reporting process. With real-time visibility, flexibility, control, and optimisation along with cost- and time-saving efficiencies, digital mobile reporting platforms are enabling facility operators to enhance productivity and safety.





