Functionality and benefits of computerised eLOG

By: Simon Toward, March 2024

Introduction

Computerized shift logs and handovers play a crucial role in power plants, Oil refineries and other heavy industrial environments by ensuring smooth transitions between shifts, facilitating communication among operators, and maintaining comprehensive records of operational activities.

The criticality of a reliable digital logbook is the heart to any operations environment not just for Operations and Maintenance but also for HSE Departments, Labs, Civil works and any other department working at the facility. Having reliable and visible information that can be easily read and identified is a key to any logbook system but ensuring that information is efficiently, reliably and clearly handed over to ensure the oncoming shifts have a full and complete view of the plant status is crucial.

Should I develop my own log?

Not all solutions are workable, for example, using home-developed systems may seem feasible initially, but there are several significant drawbacks and risks associated with these approaches.

Software developers vs plant operators – Are the people developing your system knowledgeable of what is needed and how operations run day to day?

If not their full-time job or if they are developers rather than plant operators there is a risk that the systems will not be properly maintained and developed to adapt to new requirements do they understand what is needed or are they just working from a design document or requirements?

Limited functionality – Is this a full-time job for a focussed development team? If the answer is no then the system will not be able to incorporate all the functional requirements of a commercially available system.

In-house developed systems often lack the advanced features, customization options, and scalability offered by commercial software solutions. They may not adequately address the complex operational requirements and regulatory compliance standards of modern facilities.

Compliance – All modern facilities are subject to stringent regulatory requirements and compliance standards governing operations, safety, and environmental protection. Using in-house developed systems may lead to compliance gaps, audit deficiencies, and regulatory penalties.

Sustainability – Who is supporting the system and what contingencies are in place for retained knowledge of how the system was written or how it works? Often in-house written systems do not have the continuation of support and retention of knowledge beyond a few individuals to make it sustainable.

Where does the knowledge of the industry and best practices come from? Not working with other industries or companies outside your organisation means there is a blinkered approach to what they can provide. Does it have offline mobile capabilities to gather information and process tasks at the place of work when there is no Wi-Fi?

Integrated solutions – Does your logbook interface with other systems and applications that form your operations management eco-system? Can you read from SCADA, DCS, or Plant Historians, does your system communicate with your PTW or LOTO system or can you receive and reference incident reports, Rounds & Inspections results, or information from your CMMS/EAM system?

Holding lives in your hand – If not done correctly or not maintained the developers of such products must realise that the safety and lives of people are directly affected by this type of system and the inefficiencies and failures associated with it. Are they willing to take that risk?

While home-developed systems may offer initial cost savings or familiarity, they present significant risks and limitations that can compromise the safety, reliability, and regulatory compliance of your operations. Investing in proven, commercially available software solutions designed specifically for your facilities is essential to ensure robust data management, operational efficiency, and regulatory compliance.

Failures in Logs and Handovers

While detailed information about specific incidents related to shift handover failures might not always be readily available due to confidentiality or limited disclosure, there are instances where failures in shift handovers have contributed to serious incidents or accidents in these settings. Some public examples of incidents that were a result of or exasperated by poor shift log management, inefficient handovers or missing information that should have been captured during the shift include:

Piper Alpha Oil Rig Explosion (1988)

In one of the deadliest offshore oil disasters, the Piper Alpha oil rig in the North Sea exploded and caught fire, resulting in the loss of 167 lives. Inadequate communication and unclear handover procedures were identified as contributing factors to the disaster. Critical information about maintenance work and the state of equipment was not effectively communicated between shifts, leading to a series of errors and ultimately the catastrophic explosion

Texas City Refinery Explosion (2005)

The explosion at the BP Texas City Refinery resulted in 15 deaths and numerous injuries. It was attributed to a series of organizational and safety deficiencies. Investigations revealed that inadequate shift handovers and poor communication between operators played a role in the incident. Critical information about equipment status, process deviations, and safety concerns was not effectively communicated between shifts, leading to operational failures and the eventual explosion

Soma Mine Disaster (2014)

The Soma Mine disaster in Turkey resulted in one of the deadliest mining accidents in recent history. Poor communication and inadequate handover procedures between shifts were cited as factors contributing to the incident. Lack of documentation and failure to address safety concerns effectively led to the tragic loss of lives.

Didcot Power Station Collapse (2016)

In 2016, the collapse of a boiler house at the Didcot Power Station in the UK resulted in multiple fatalities and injuries. While the exact cause of the collapse was investigated, deficiencies in maintenance procedures, communication between shifts, and inadequate documentation of structural integrity assessments were identified as contributing factors.

Concord Steam Plant Explosion (2021)

In 2021, an explosion occurred at the Concord Steam Plant in New Hampshire, USA, resulting in injuries and damage to the facility. While the investigation into the incident is ongoing, deficiencies in maintenance practices, inadequate documentation of equipment inspections, and lapses in communication between shifts have been cited as potential contributing factors.

These examples underscore the critical importance of effective shift logging, communication, and handover procedures. While direct evidence linking incidents solely to poor logging and handover practices may be limited, the broader context of operational failures often involves deficiencies in communication protocols, documentation practices, and adherence to safety procedures across shifts. Implementing robust logging and handover systems can help mitigate risks, save lives, enhance operational safety, and prevent catastrophic incidents as well as help maintain a company's reputation and investment opportunities.

So What Should you look for?

Every site has its own list of what they need from an operations system but all will agree that logbooks and shift handovers are a critical part of this. When selecting a logging system it should be able to fulfil some basic requirements and offer expandability to track Rounds, Inspections, Audits, Data recording, Incident management as well as be able to track plant activities such as PTW's, Isolations, Outage tracking and other operational intensive tasks. Below are some of the main areas that computerised logs must provide:

Real-Time Information Sharing

Computerized systems enable instant updates and sharing of critical information among operators, ensuring everyone is on the same page regarding plant status, issues, and ongoing tasks.

Documentation and Accountability

They provide a detailed record of activities, events, alarms, and responses throughout each shift, establishing a clear trail of accountability and facilitating post-incident analysis.

Efficiency and Accuracy

Automated logging reduces the risk of errors associated with manual data entry and ensures consistency in reporting standards, enhancing overall operational efficiency.

Enhanced decision making

Operators can access historical data and trends quickly, enabling informed decision-making and proactive problem-solving to prevent potential incidents.

Regulatory Compliance

Many regulatory standards require power plants to maintain comprehensive records of operations, incidents, and safety procedures. Computerized logs help fulfil these requirements more effectively

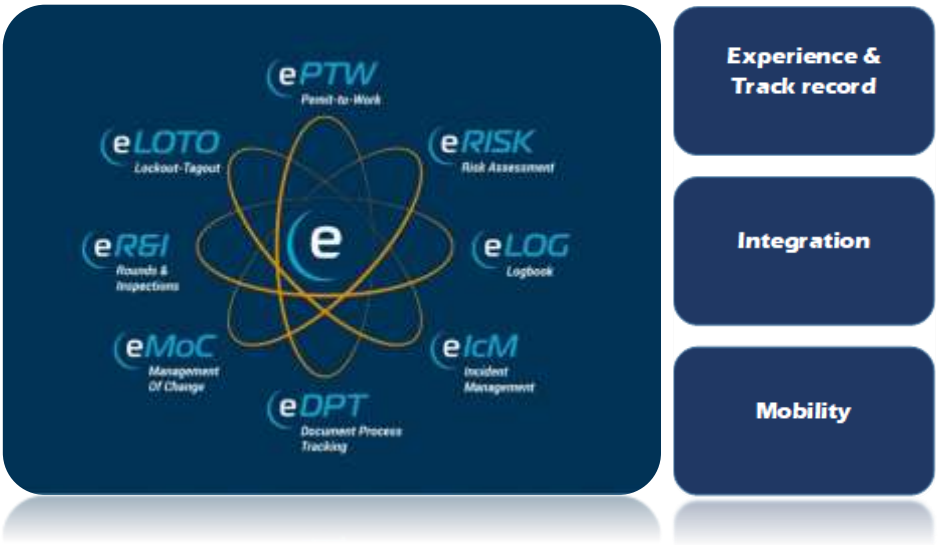
Clear and accurate information views

Clear presentation of the above information in the form of dashboards and reports.

NiSoft Eclipse Overview

Before listing some of the features of the NiSoft eclipse3 eLOG it is worth mentioning that this is just one of the Operations Management modules offered by NiSoft. Each module will run as a fully integrated part of the eclipse Operations Management solution sharing data, Actions Tasks and outcomes across all modules for improved efficiency and awareness.

The suite is shown in the diagram below but this document is focussing in on the eLOG module only. For details on any of our other modules please get in contact.



Say goodbye to outdated logbooks and transform your documentation process with our logbook software. Capture critical data, streamline communication, track safety concerns, mitigate risk and achieve operational excellence through our complete suite of Operations focused solutions and services.

Eclipse eLOG Features

Configuration

The e3 system offers extensive configuration from simple lists, shift setup, pre-set filters, and reports (Shift handovers and general reports) to Dashboards, pre-defined data logs, staff manning requirements, log entry layout and process flow setup. This gives the user the information and layouts needed without the need for a custom written system.

Customisable log handover report

The client has the ability to setup their own shift handover report(s) that capture and format the data to the exact requirements.

Multiple user configurable logs

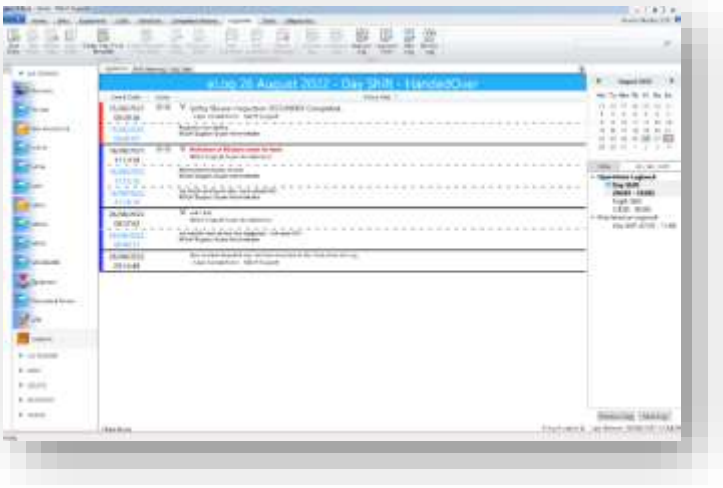
Authorised users can create their own logbooks whether for Operations, HSE, Maintenance, Chemists or for specialist areas such as Outage logs, Tanker deliveries, Security breaches, investigation logs and more.

Selectable handover tasks/entries

The shift handover functionality provides as list of all tasks from the current shift that may include pre-selected handover items. These can be manually adjusted by the Shift Owner and additional items can be selected. Simple and efficient.

Audit trail of each shift

Following a handover the items on the outgoing shift are locked once the oncoming shift Approve the handover items. This means there is a full and clear log of all events that occurred on any selected historical date.



Direct emailing of task entries and reports.

Standard features on the log entries and handover report(s) mean that information can be emailed to other recipients. PDF's can be produced and email, URL's to the system can be sent and this is automatic or on a manual basis so that additional text can be added to an email or additional recipients selected.

Staff manning and tracking

Each shift may have minimum requirements for skills and people, this system can manage who needs to be on shift and if they have assumed the position before Shift can start. They system also tracks staff change mid-shift as well as when individuals leave the shift.

Sharing log entries

Tasks along with any notes, comments, attachments and more can be shared with other logbooks to ensure there is full visibility of all actions and updates associated with it.

Notes and comments

Instructions and information relevant for the following shift as well as current active log activities.

Extensive log information

Because the logbooks are defined by the client it is possible to hold virtually any type of data form simple selectors, text boxes and drop down lists to links with live documents, Photos, recorded interviews, dates and many types of automated or calculated entries.

Attachments

Select any type of file from your network or device to attach to the log entry. This can include PDF documents, Drawings, Photos, voice recordings, videos, emails and much more.

Auto entry from / to other eclipse modules

The log entries are not always manually entered, eclipse has multiple options to auto record log entries based on events, integration, alarms and/or monitoring. Here are just some examples:

Issued Permits or Isolations

When a Permit or Isolation document gets to a particular stage in the e3 system an automatic entry can be recorded in the log with any data from the document as well as a live link and live status update if it changes.

Other eclipseSuite modules

The same also applies to any part of the eclipseSuite:

- Creating Log entries from R&I (abnormal readings)
- Creating Log entries from an incident report
- Raising SAP/Maximo Work request from a log entry.

List filtering and views

A standard feature across the entire eclipseSuite is the ability to setup your own list views and filters of data so that you see exactly what you need. These pre-defined list views can be saved and recalled whenever needed.
The sorting and filtering of lists also allows higher priority tasks and reports to be shown at the top of the list with highlights and current status updates from other modules, via 3rd party inputs or from manual inputs.
The eLOG module also offers additional features in the list to allow colour coding and identification of the task status via icons in the lists.

Log templates

If you want to enter standard tasks but just specify a different KKS, location or other small piece of data then the system also allows selections from pre-approved templates that are stored in a structured tree view for easy identification and selection.

Reoccurring tasks / scheduled tasks

The eLog system can also schedule tasks in the future by selecting a date and entering a task. There is also a very useful tool that allows you to repeat a task over hours, days, weeks, months or even years as any interval and on selected days if needed. These options allow users to create to-do lists or plan scheduled tasks or walk downs.

Integration to EAM/CMMS

The DEx interface tool allows real time 2 way communication with your CMMS or EAM (This could be SAP, Maximo, Oracle or any other modern system). Some key features of the interface include

- Selectors and picklist (eclipse and external (i.e KKS)
- Using the functional location lists or equipment lists from your EAM/CMMS
- Using Points of Isolation from Eclipse
- Using Work Order reference details from EAM/CMMS

Integration to Data Historian

The DEx interface tool is not just for your CMMS, it can plug into any system that has an API or Web Services, and this may also include your data Historian (i.e. OSI Pi) to allow reading to be taken from your DCS or SCADA system for:

- Snapshot of reading and plant status at end of shift
- Create log entries based on Alarms or abnormal results in each shift

Security/Competency controlled logs

A full security system support the entire eclipseSuite so that users with the correct competencies and rights are the only ones that can perform (or in some cases view) the tasks logged in the system. The security system is compatible with Active Directory or can run in an application standalone mode (or Hybrid) to allow not client staff to perform designated activities in the system or via mobile.

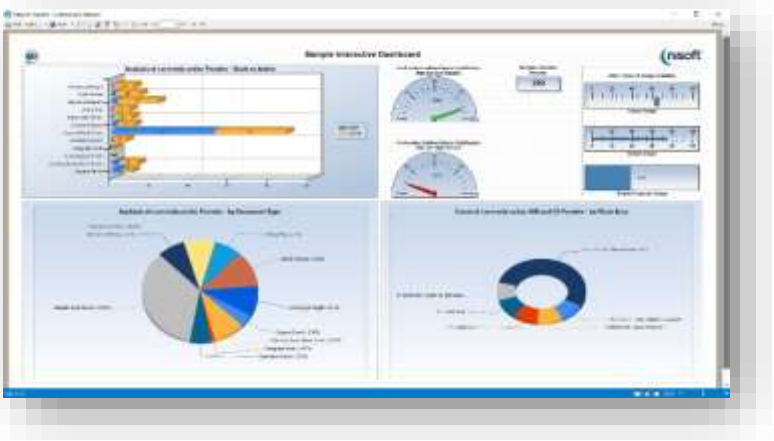
Easy delegation of Authority\Role based User Security Groups.

Multi-Lingual

The e3 framework can be setup with multiple languages to change the menus and options through the system. The forms are also configurable for Dual language as it is a safety issue to print in a single language related to the user's profile this also applies to reports and any other outputs from the system or onscreen forms.

User report writing tool

Another standard feature is a fully integrated reporting tool that allows the creation and management of any type of report from simple text lists to more complex analytical and graphical reporting. This allows for the creation of dashboards with a display of real-time data.



Mobile logbooks (On/off line multiple platforms)

To enhance the features of the eLOG module further, NiSoft offer the mLOG module that gives the power of electronic logging in the field via a mobile device. Our systems are platform independent and use syncing technology to load the required information onto a mobile device so that it can be used to log events and view activities in area that don't have WiFi connectivity. When in range of WiFi these logs can be updated to the main eLOG system.

The mobile applications also make use of the hardware available on the devices. So if the mobile has a camera then photos can be taken and attached to a log entry, Barcode scanning can be used to check into a plant area and see filtered lists of events or task for that area.

Where devices have other capabilities such as video or sound recording, these can also be captured and added to the Log entries and synchronised with the main eLOG system once in range of WiFi.

Rounds and Inspections (Additional License required)

To further expand the capabilities of the logging system NiSoft also provide a module dedicated to the collection and mapping of data collected in the field via our mR&I mobile device. The eR&I module is detailed in other documentation available from NiSoft but is a very close companion to the elogs module described.

NiSoft Track record and expertise

NiSoft is dedicated to a single software solution that is focused on plant operators and the tasks they perform daily. We have a large global team of experienced individuals who make the implementation and support of these systems their goal.

A software system alone is not a guarantee to a successful implementation or experience of software, a knowledgeable team to implement, support, and develop the solution is also of major importance. With NiSoft you are in safe hands, we have been implementing Safety management solutions for over 30 years and have a client base of over 600 companies, spread over 27 countries, servicing Power Generation, Oil & Gas as well as other heavy industries, and expertise from consultancy, project delivery, and support.

Here are just some of the areas where NiSoft can give more than just a piece of software configured to your site-specific requirements.

- NiSoft's 30 years of focused experience in Operations Management software
- Annual User Group meetings and knowledge sharing (Regional)
- User feedback to provide industry best practices
- A dedicated team that Develops, Maintains, and Supports your system.
- A proven solution used by plants and facilities across the globe.
- Qualified staff with plant and process experience
- 24/7 help desk and maintenance packages
- Consultancy services to optimize your system
- Focused on Operations and Safety Management (integrated in one system)