PSS Incident Data Journey

The PSS strategy was updated 2024 and commits the organisation to becoming data-led by 2028. PSS aims to increase the collection and use of data across both safety and skills functions - to ensure PSS output is directed in to the areas with the greatest need, to enable better analysis of PSS success, and to demonstrate the power of data and AI in improving safety within member organisations.

PSS envisions a future where every aspect of port operations is guided by comprehensive data analysis, enabling proactive identification of potential risks and the implementation of targeted measures to safeguard personnel, vessels, and cargo. PSS will take the lead in demonstrating the value of collecting and using data to unlock the power of Artificial Intelligence (AI), computer learning (CL) and advanced data analysis to improve safety.

The 2024 strategy highlights how PSS will collect and use data more effectively to become data-led across all the organisation. This paper deals solely with developing the collection and use of members' incident data.

The journey so far

PSS has been collecting incident data in some form for ten years. Originally this took place in two ways – a quarterly collection of incident data from larger ports and a yearly collection of data from smaller ports. The quarterly data was collected by PSS directly and the annual statistics by an independent association. This meant that there was little consistency in the data collected, minimal analysis, and little use of the data outside of counting the number of fatalities. It also meant that was difficult to clearly analyse what had driven any change or improvement that had taken place. There was little consistency in reporting which meant that any analysis was poor and lacking quality assurance.

Since 2020, all data has been collected monthly and the separate annual collection was scrapped. Members have also become more engaged and the annual data meeting has developed an ever more consistence approach, standard definitions, and widened the amount of data collected.

In 2021, PSS held the first annual data meeting with members to gain agreement on the route forward to improve the collection and use of incident data.

A standard excel spreadsheets for reporting data was developed, which PSS then fed into a Power BI platform to present the information in a clear way and which allows members to manipulate and display it for their own use.

At this time, the collection of near miss data, or leading indicators also began. Collecting this information can help to determine when the potential for incidents in the future may be so that measure to mitigate the risks can be put in place.

In the 2022 and 2023 meetings, more advances were made in standardising definitions, categorising of incidents and near misses as well as improvements to the presentation of information. In 2023, all current contributors bar one agreed to remove the anonymity of the data to allow them to better compare their incident levels with ports of a similar size and operation.

Alongside this, PSS worked with members who were not taking part in data collection, to encourage them to do so. Despite these efforts, the number of members contributing data,

has not significantly increased. However, it is worth noting that when new port members have joined, the data collection and benchmarking has been sighted as one of the reasons for joining and they quickly became active members of the project.

The lack of take up from smaller ports is generally considered to be a resource issue within those ports, where the health and safety team might only be one or two people and they therefore can not spare the time to complete the data entry.

At the same time, larger ports are becoming much more data-driven. Many of the large ports have digitised reporting of incidents, investigation software and AI-assisted plant. This means that the data-gap is increasing and smaller ports are getting left behind and not able to take advantage of the benefits of comprehensive data.

However, even for the larger ports, the right data is not always being collected. In early 2024 PSS undertook a data pilot with member technology member COMET. This study took all incident-related data from four members and used their AI technology to define common root causes. One of the outcomes of this pilot was that many ports are not recording enough data from incident investigations for AI to be effective. Read more about this pilot here: www.portskillsandsafety.co.uk/pss-calls-for-sector-improvements-to-data-collection/

This pilot project will be expanded and forms part of a package of benefits provided to PSS members by COMET, to improve safety culture through training, incident investigation and data analysis. However, PSS appreciates that this level of analysis will not be suitable for all members, and that more still needs to be done to support and encourage smaller ports to take part in some form of data collection.

Therefore, PSS is proposing a tiered approach to incident data collection for members.

Entry level – benchmarking dashboard

PSS will continue to operate a data collection method using excel spreadsheets and Power BI to present information. PSS will continue to receive monthly excel reports and COMET currently has a one-year contract to the end of 2024 to manage this process alongside making recommendations to simplify the collect method and improve the PBI display options.

This data continue to be used to form the annual reports. The information required and definitions used will remain as confirmed in the 2023 meeting so that moving forward a better longer-term analysis will be possible in these annual reports.

More members will be encouraged to take part and PSS will contact all those remaining ports to talk directly about the issues they may have. One of the issues that has previously been raised is the need for data from other departments such as Human Resources. In the future PSS will work with the Port Skills Group to investigate ways for those on the training and HR side of the business to get involved with this (and other) data collection to remove the burden.

Those who have resource problems due to the size of their H&S departments will be encouraged to supply basic amounts of information and PSS will discuss how they currently collect accident and near miss information to understand how it can be taken in the simplest form into the PSS style. For example if they can complete just basic numbers of incidents or observations then this will still inform the totals.

PSS will also consider whether a new membership option can be developed for ports who do not want to participate in wider best practice sharing but may be inclined to share incident information. In the previous five years, fatalities have occurred which involved port workers employed (or contracted) to non-members. This are not recorded by PSS and are not featured in the annual review statistics (although they are noted in the commentary). This can mean that PSS gives an unrealistic view of the level accidents in the sector and it would be useful to be able to represent the wider sector in its data.

Intermediate Level – Investigation data collection

COMET has agreed to provide PSS and PSS members with a free version of the COMET Investigate module. This tool allows ports to conduct and store investigations digitally, and use the built-in AI analysis tools to find common root causes which may be missed by human evaluation.

All the root cause data collected from these investigations (not any of the personally identifying elements of the investigations themselves), will be stored centrally to allow PSS to gain better insights into the root causes of incidents rather than just the initial causes displayed via the data dashboard.

No specific details of investigations are made available to PSS, the system purely allows for PSS to access the wider evaluation to understand where common root causes are arising in ports to highlight where additional resources may be required. The only investment ports have to make for this software is the cost of the initial training, which is delivered in partnership with PSS and includes a membership discount.

For members who require support in conducting investigations into more serious accidents or those who would like an independent investigation, COMET can also provide this service at a discount to PSS members. These investigations will utilise the COMET Investigate module and the results can therefore also feed into the sector-wide data collection.

Advance Level – Advanced AI analysis

Following the pilot project in 2024, PSS will continue to promote the COMET Signals module which allows standalone AI driven analysis of free text from all unstructured health, safety and environment records. The pilot highlighted that more detailed investigation reports are needed to unlock the full potential of AI and therefore this module is for those members who want to move to providing richer and more detailed data to PSS and help the sector take the next step in data analysis.

This module requires ports to provide more data, including long-form write ups of investigations, locations and other details, to allow the natural language processing of AI to understand the information behind the free text. Ports who contribute will be able to view the data supplied for other members in order to gain a deeper understanding of their safety record compared to other members.

This module can be purchased by PSS members at a discounted rate. Purchasing the system allows ports to upload their incident data from their internal systems without any re-entry requirements.