Simplification of the Safety Management System

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Introduction

Human error contributes to more than 75% of today's marine losses. Is human error new or increasing? Human error has always been there and will probably also always be there. Human error's share of total loss causes has increased and deserves its share of our focus.

The Result of No Strategy

Looking deeper into typical accidents, we find that the relevant knowledge and solutions are onboard, but not used. Many reports conclude with "procedure not followed".
But procedure not followed is seldom the root cause. Procedure not followed is just a symptom. One tanker company manager explained that their Safety Management System (SMS) had become too big, too complex and lost sight of the end user. This was a problem in all the 20 SMS's that we studied in shipping, oil and gas.

Digging deeper, we found that the root cause was that the companies had no standards for making user-friendly procedures. Some said overly complex text was necessary for various reasons and that it was a strategy they had to follow. Lessons learned from the projects showed the opposite; it was often a result of no strategy.

Inspiration from Aviation

I spent 27 years in the aviation industry where we had many accidents related to overly complex procedures and checklists. We got a big wakeup call after Swissair had a fire in the video entertainment system. Faced with heat and smoke, the pilots still circled and read the complex checklists. This took too long; they crashed and lost all onboard.

Are too Long Checklists Risky?

What did we learn? Overly complex checklists compete with common sense and experience. So, we made shorter lists with a tighter focus on the most critical items. If unable to control the smoke or fire, the new lists quickly instructed us to land. This might have saved Swissair.

Not Room for Everything in the Checklists

Our new vision was to have a more risk based focus through concise simplicity. We believed there was a clear link between how user-friendly something was and how much we would use it. We accepted that there was not room for everything on the checklists. We reserved the checklists for the "killer items".

Best Since Doctors Began Washing Hands

Other industries learned from aviation. As an example, Haukeland University Hospital in Norway reduced complications and mortality rates up to 42% by using aviation-inspired checklists. Norwegian TV2 called it the biggest breakthrough since doctors began washing their hands. Shipping, oil and gas are now also using these concepts.

Shipping, Oil and Gas

In 2014, Teekay's navigation procedures had just below 49,000 words, they simplified it down to just above 17,000 words. That was a 65 % reduction, but reducing words was not the goal. Our goal was to be concise. This means saying what we need clearly with as few words as possible. 200 Teekay vessels are now using them.

Bernhardt Schulte Ship Management (BSM) did the same for 600 BSM managed vessels. Eidesvik did it for a fleet of 11 vessels. Many other large and small companies followed.

Recommendations from Organizations

Human error is a concern for organizations such as the Oil Companies International Maritime Forum (OCIMF). Consequently, OCIMF's Tanker Management and Self Assessment (TMSA) focuses on the human element. TMSA version 3 expands even more on this by explaining how to write and maintain an effective SMS.

TMSA 3 Plain Language Key Words	
Identifiable Steps	Accessible
Logic Manner	Simplify and Clarify
Sufficient Details	Specialist Resources
Benchmarking	Graphic Presentation

The table above shows typical SMS key words to help us write in plain language so our people can complete their tasks correctly and consistently.

In Norwegian based Lovoy AS, we have organized many SMS improvement and simplification projects. This paper shares some of our experiences when working with these topics in many different industries.

Windbag Text

Procedures are like people, some talk a lot but say very little. We call them windbags, and this is not a compliment. You do not want inflated windbag text in your SMS.

Text is like math – we can present the same thing in a complicated or a simple way. Why write $\frac{12}{18}$ when we can write $\frac{2}{3}$?

Why write commence when we can write start? Is it not better to write stop than discontinue? We made a new simple word dictionary published at www.lovoy.info

Dictionary Example

Complex	Clear
Give consideration to	Consider
During the period of	During
A number of	Some
Give the recognition to	Recognize
Is concerned with	Concerns
Because of the fact that	Since

20 words   6 words

70 % reduction

Passive Text – Passive Mind

Windbag text uses a lot of passive sentences. Passive is a pest when you want to design a proactive safety system. We made a method called text washing, which can reduce the word count by more than 50%. We also developed easy to measure Key Performance Indicators (KPIs) for proactive user-friendly text.

Spaghetti Structure

The second and biggest problem was spaghetti structure. This resulted in a tangled complex structure branching through our documents. It failed to present steps in the order we must do them.

The biggest spaghetti problem was between checklists and procedures. Most SMS's are like large icebergs. The checklists are the tip of the iceberg, they cannot hold the entire SMS. We needed to prioritize and permit items into the checklists based on their risk.

To find more information about a checklist item, we must be able to dive down below the surface

into the procedures. Procedures have more details for training and standardization. This is where you go for more in-depth explanations about something you are uncertain about. Our biggest finding was that there was little to no link between the checklists and procedures. This had a large potential for improvement since we knew we needed to have workflow-based procedures in the same order as the checklists.

Cut the Spaghetti into Chunks

Chunking, it is a pedagogical concept that puts similar things together. For operational procedures, this means organizing things based on when we do them. The old procedures where chunked by academic topics without thinking about when we do the tasks. We therefore made new rules to help writers organize actions into workflows based on when we do them.

From Prose to Workflows

Most procedures were in prose text even though they described operative steps. With prose text, we mean regular sentences. It is better to write most procedures in proactive imperative steps. Most procedures also need an introduction using prose text. We must find the right balance between prose and step procedures. Today we have too much prose text.

New step procedure
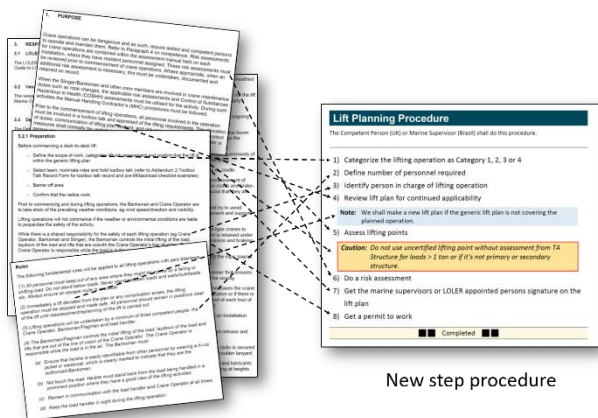
Old spaghetti prose text procedure

Layout

The last element we looked at was layout. Pages cramped with text makes it hard to find what you need. All the companies needed a clear visual layout that they could easily update themselves. I therefore made an advanced but easy to use Microsoft Word template with notes, cautions, warnings and other styles. This became known as the Lovoy template. It had layouts for regular prose text, proactive step procedures and
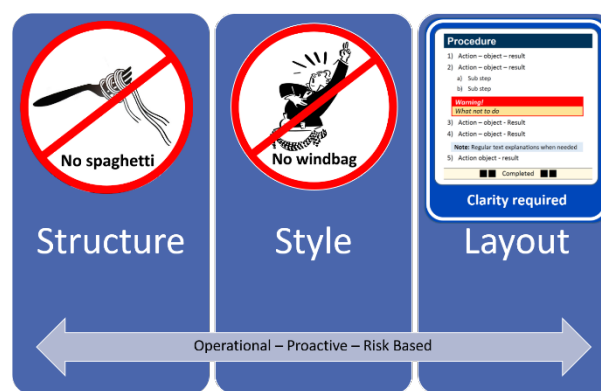
checklists. The projects used the Lovoy template for paper and electronic documents.

User Feedback

Feedback from the end users showed that the new manuals were:

- Easy to read
- Easy to find what you needed
- Shorter and more concise
- Easier to learn
- Easier to use
- Safer
- More efficient

Surveys typically showed around 70% increased perceived usability.

Good Tools – Half the Job

The last question was – could we use internal writers? Could we train internal staff without inborn gifts as writers to solve the problems we found? Good tools were half the job, knowing how to use them was the other half. We made plain language writing rules and methods for how to untangle spaghetti structure. We used a mixture of workshops blended with e-leaning. After training and practice, the companies' staff became very proficient.

SMS Improvement Strategy

TMSA 3 goes into effect in 2018. Tanker companies are eager to follow the new recommendations. To simplify and improve an SMS seems like an unimaginable task. Where do we start? What kind of resources does it take? How long will it take?

TMSA 3 recommends (1) to identify areas that need attention and (2) to ensure continual improvement. Quality experts in most industries say that continual improvement is not a quick fix. The goal is to find the root causes and fix them.

Simplification of the Safety Management System, by Terje Lovoy

Our first goal should be to stop our people from adding information not meeting the new standards. Since this is a continual process, we must integrate it into our day to day operations. I therefore recommend that you make smart goals with KPIs and train the experts who are responsible for the procedures.

You can train your people and rewrite parts of your SMS at the same time.

Poor Input Gives Poor Output
Some thought the solution was to switch to a new SMS software system. This may have been a good idea, but it would not solve the windbag and spaghetti problem. If you put inefficient text in, the same would come out. Companies that improved style and structure before they switched their systems, had the best results.

The Way Forward
What is the way forward if you want to simplify your system? First, you need good content. You need the required facts. Next you must simplify and make it user-friendly without losing facts. Simplification can be a challenge. Without the right tools and knowledge of how to use them, you risk washing out the information you need.

Most support simplification, but few have specific methods for how to achieve it. Simplicity does not happen by itself – you must design it and this requires resources. Simplicity is abstract; it is easier to get funding for technical projects. But it is not the technical factors that causes most losses. Since human error causes 75% of today's marine losses it deserves its share of our safety focus. With a modest investment, compared to the large investments we manage, there is a sizable potential for making our SMS's more user-friendly. To succeed we must put a value on simplicity.

We must invest in the training of our own people. With support from management, SMS improvement projects are low risk. They are low tech, do not require new software or hardware, but have huge potential.

Management Must Walk the Talk
There is a clear link between management involvement and the results. As management, we must lead by example and walk the talk. How do we walk the talk? First, we need to learn enough to know what windbag text and spaghetti structure is. Next, we must notice and praise those using simplicity to improve safety and efficiency.

References

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Resources

Offshore Production SMS (Video)

BSM Navigation Procedures (Video)

New Teekay Nav Procedures (Video)

User-Friendly Procedures are Used More (Video)

Simple Word Dictionary