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# Lean 6S 5S + Safety

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Disclaimer; nothing in this presentation constitutes formal engineering or occupational health and safety (OH&S) advice.

# Overview

The 'eathen in 'is blindness bows down to wood an' stone;  
'E don't obey no orders unless they is 'is own;  
'E keeps 'is side-arms awful: 'e leaves 'em all about,  
An' then comes up the regiment an' pokes the 'eathen out.



All along o' dirtiness, all along o' mess,  
All along o' doin' things rather-more-or-less,  
All along of abby-nay, kul, an' hazar-ho,  
Mind you keep your rifle an' yourself jus' so!

Rudyard Kipling presented the basic concept behind 5S in "The 'Eathen"

abby-nay = "Not now." kul = "Tomorrow." hazar-ho = "Wait a bit."

# Learning Objectives (1)

1. Concept of *friction*, the enemy of performance
2. 5S is a workplace organization process that supports safety, lean manufacturing, and ISO 9001:2015
3. 5S consists of:
  - Seiri = Clearing Up
  - Seiton = Arranging
  - Seiso = Neatness
  - Shitsuke = Discipline
  - Seiketsu = Ongoing Improvement

## Learning Objectives (2)

4. Safety (the 6<sup>th</sup> S) is achieved through:
  - Safety audits
  - Workplace safety committees
  - Hiyari hatto ("experience of almost accident situation," a safety near-miss report)
  - "Can't rather than don't" (Henry Ford safety principle)
  - These activities all support key clauses of ISO 45001:2018.

4

PATHS (Pennsylvania Training for Health and Safety) offers free webinars on workplace safety committees and other occupational health and safety (OHS) topics. Webinars are available to employers outside of Pennsylvania.

<https://www.dli.pa.gov/BUSINESSES/COMPENSATION/WC/SAFETY/PATHS/CALENDAR/Pages/default.aspx>

# Friction (1)



**Friction:** "...the force that makes the apparently easy so difficult," and "countless minor incidents... combine to lower the general level of performance, so that one always falls short of the intended goal."

**5S helps get rid of friction.**

5

Clausewitz, Carl von. 1976. *On War*. Translated by M. Howard and P. Paret. Princeton, NJ: Princeton University Press

"Countless minor incidents" can include the need to search for tools and parts, fix unexpected equipment breakdowns due to lack of preventive maintenance, and other seemingly minor annoyances whose cumulative effect is to harm overall performance.

Clausewitz portrait by Karl Wilhelm Wach, public domain due to age.

## Friction (2)

- Clausewitz described how bad weather can prevent military units from moving according to schedule. Mud played a role in France's disastrous loss at Agincourt (1415) by bogging down the advance of their armored knights and men-at-arms.
- What happens if our just-in-time shipment arrives several hours late, and we do not carry protective inventory?

## Friction (3)

- "It's the frost - sometimes it makes the blade stick." (Gladiator, 2000)
- Battle of the Chosin Reservoir, 1950
  - Nighttime temperatures down to -42 °F (-41 °C)
  - M1917A1 machine gun cooling jackets had to be filled with antifreeze rather than water
  - Mortar baseplates were warped by recoil against frozen rather than soft ground
  - M1 Rifle's bolt face would freeze to the barrel

7

Martin K.A. Morgan "The Korean War's Frozen Chosin" *American Rifleman*, Tuesday, January 26, 2016

<http://www.americanrifleman.org/articles/2016/1/26/the-korean-wars-frozen-chosin/>

All these examples exemplify friction, although in this case the issues were or should have been foreseeable noting that antifreeze was provided for the machine guns. The temperature-related performance characteristics of the lubricating grease for the M1 Rifle also should have been available. **The takeaway is that we want to exclude all forms of friction from the workplace.**

There is meanwhile a scene in *Gladiator* (2000) in which one of the men who was detailed to kill Maximus tries to draw his sword, and discovers that it is frozen in its sheath. "It's the frost - sometimes it makes the blade stick," Maximus explains before he kills the man. This is another example of failure to identify and anticipate risk.