# LASTFIRE

Large Atmospheric Storage Tank Fires

## Developing best practice guidance in storage tank Fire Hazard Management

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# An industry consortium of international oil companies reviewing the hazards and risks associated with storage tank fires

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# Steering Panel Meeting Budapest, November 2015

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# Thank you!

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# Firefighting Foam

# Do we have a crisis?

# Firefighting Foam

## Scene setting for next presentations

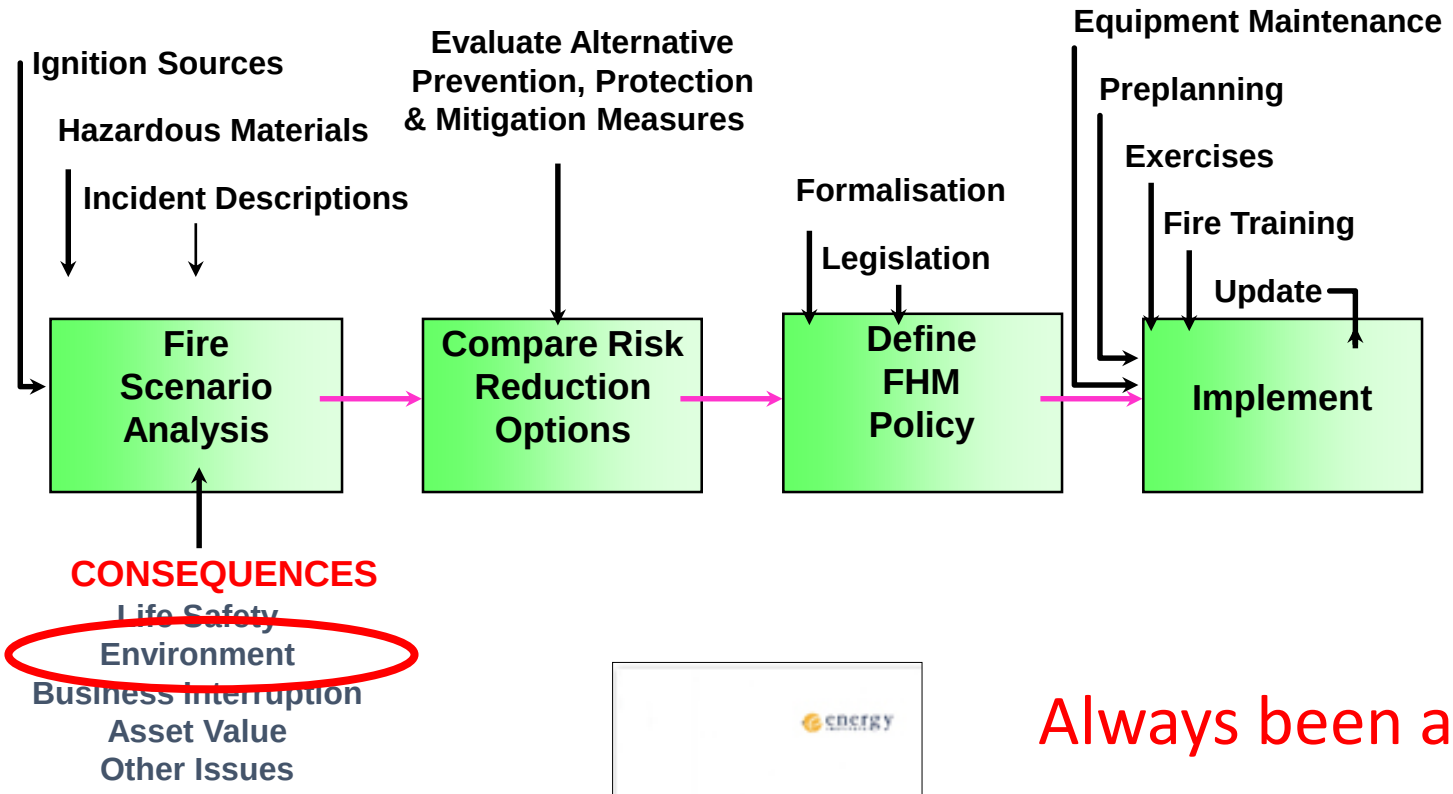
Increasing environmental concerns

Increasing environmental controls


# Certainly more awareness


**Certainly a lot of concern!**

# FIRE AND EXPLOSION HAZARD MANAGEMENT

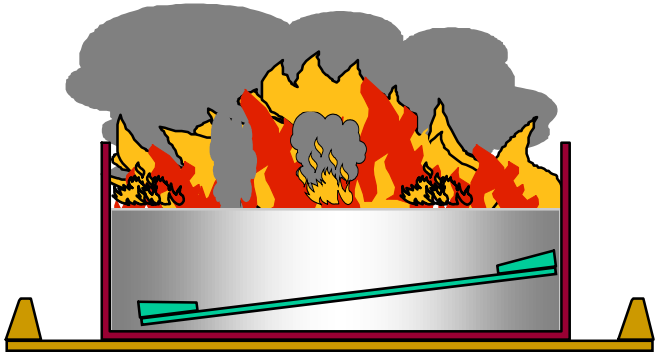



Always been a factor

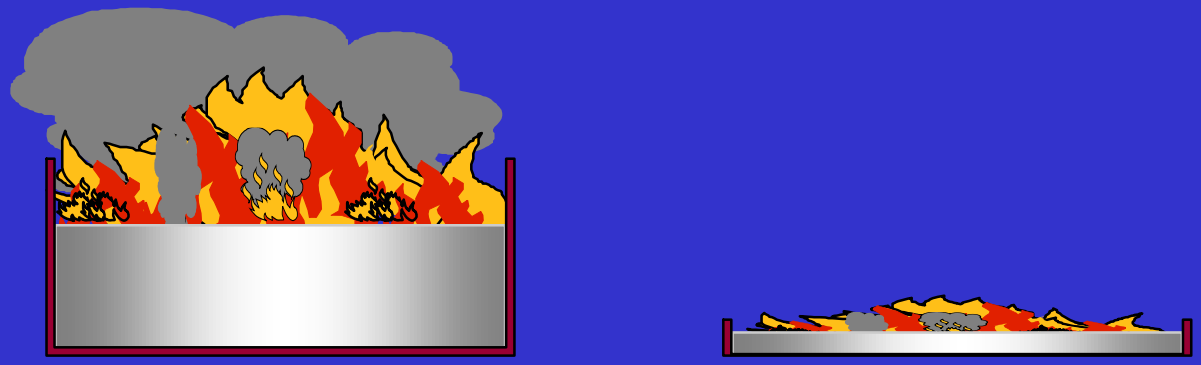
Is it a new concern?

Back to basics!

# Tank Fire Response Options



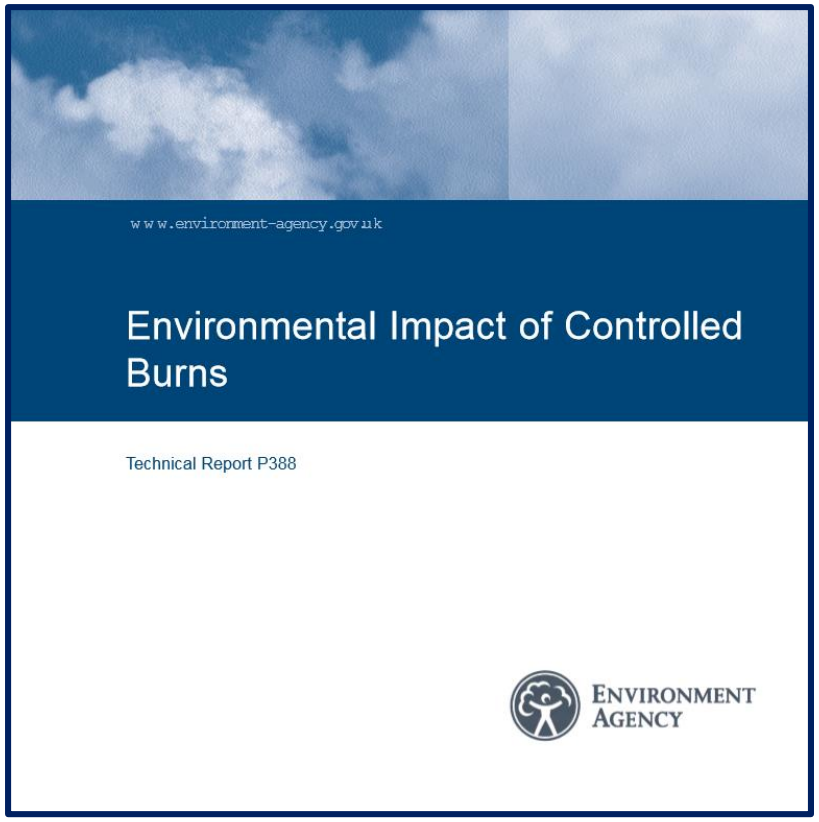
Do you want to put it out?

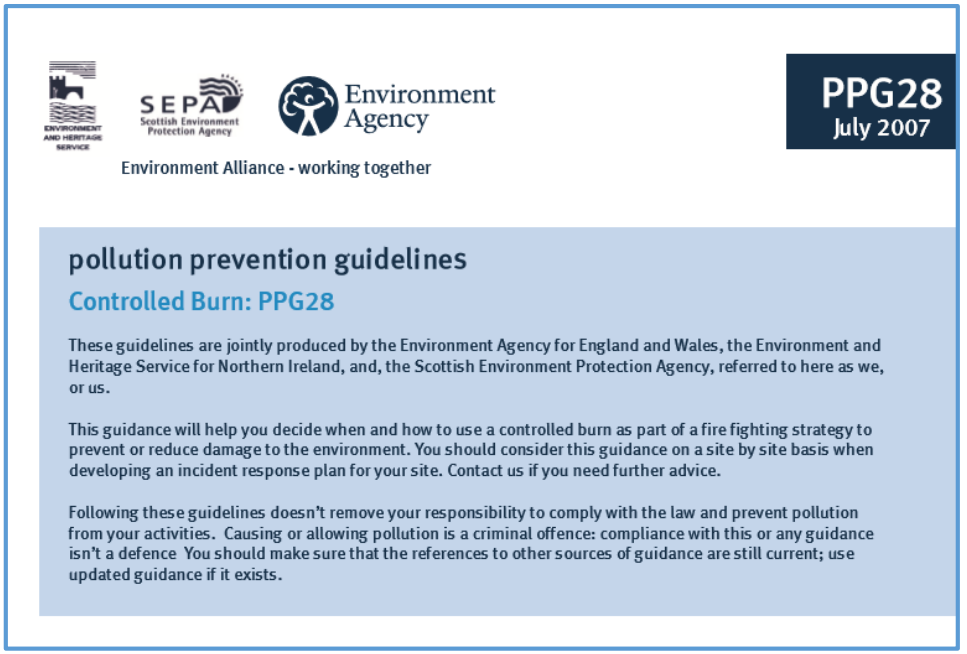


# Pump-out and Controlled Burndown


Tank at full height
1243

# Burn out!




Smoke?

Incident duration?

Asset loss?

Public image?

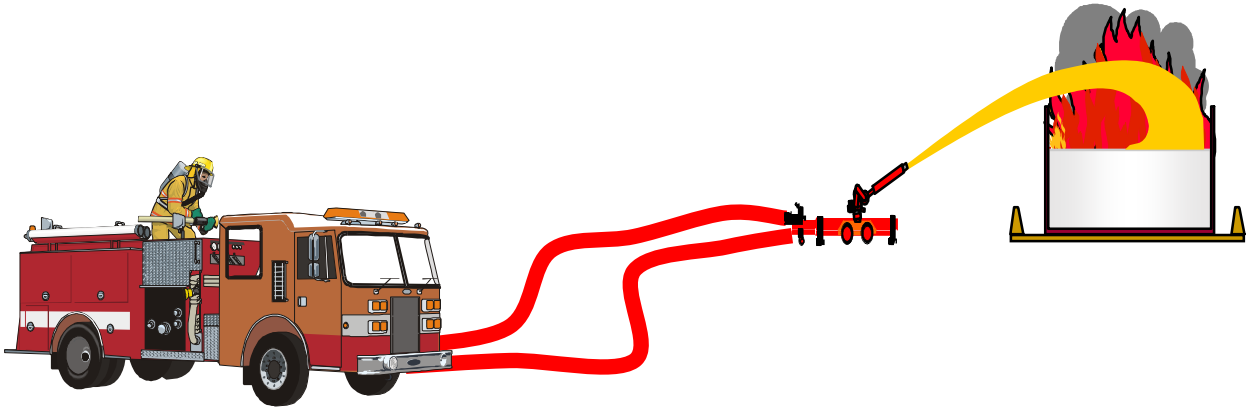
# Environmental effects
# Always a balance!

Both have an environmental consequence

And other consequences of course!

Let it burn

Firewater run off



Normally you want to extinguish!!

How do you minimise environmental damage?

- Contain everything on site
  - Often not possible
- Minimise usage
  - Most efficient extinguishing
- Minimise effects
  - Least damaging

Ideally the same foam

But not the case yet!

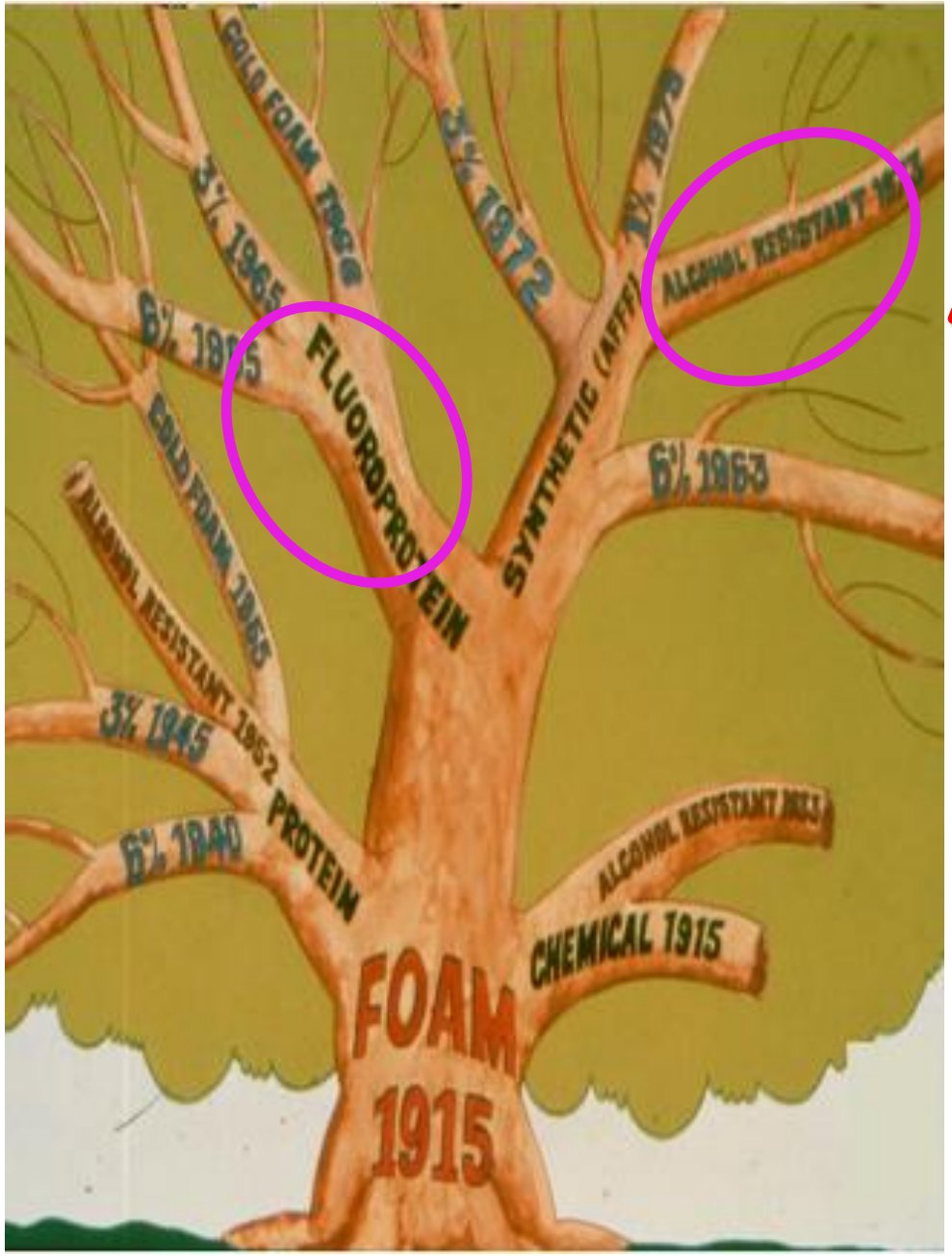
Getting closer!

And not the end of the story!

# The foam with zero environmental effect does not exist

Some “poetic licence”

There will always be other contaminants too!




**Current situation?**
**A history of development**
**Well proven foams**

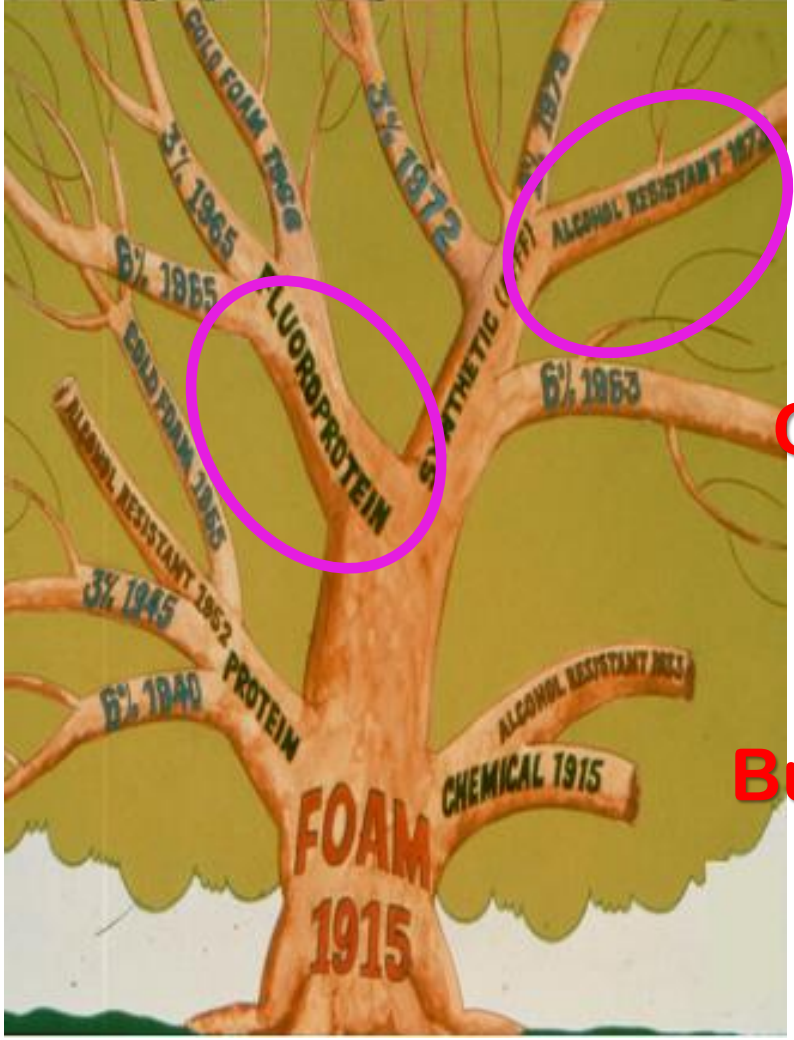
**An old picture**
**~ 1980!**

**Fluorosurfactants 1960s**
**AR AFFF 1970s**
**Well established technology**


It works!

Sarnia

# Orion




**Expertise**
**Optimised Formulations**
**Physical Properties**
**Proven Performance**
**Experience**
**Built up over a long period**

**What do we need to know if we have to change?**
**FF or C6 or anything else!**
**We need to get the same information and experience**

# Back to basics again!

**What is the most important requirement for foam?**
**Will it extinguish the fire?**

**The ideal fire test!**

**Tends to be expensive!**

Have to be realistic and bring the test down to a workable size!

# BUT!!!!

Must be relevant to scenario
Must differentiate
Must include safety factors

# Choosing a Fire Test

- Fire Test Basic Requirements
  - Relevant Fire Type / Conditions
  - Critical Application Rate
  - Relevant Application Technique


An example
Foam Fire Test For
Storage Tank Fires
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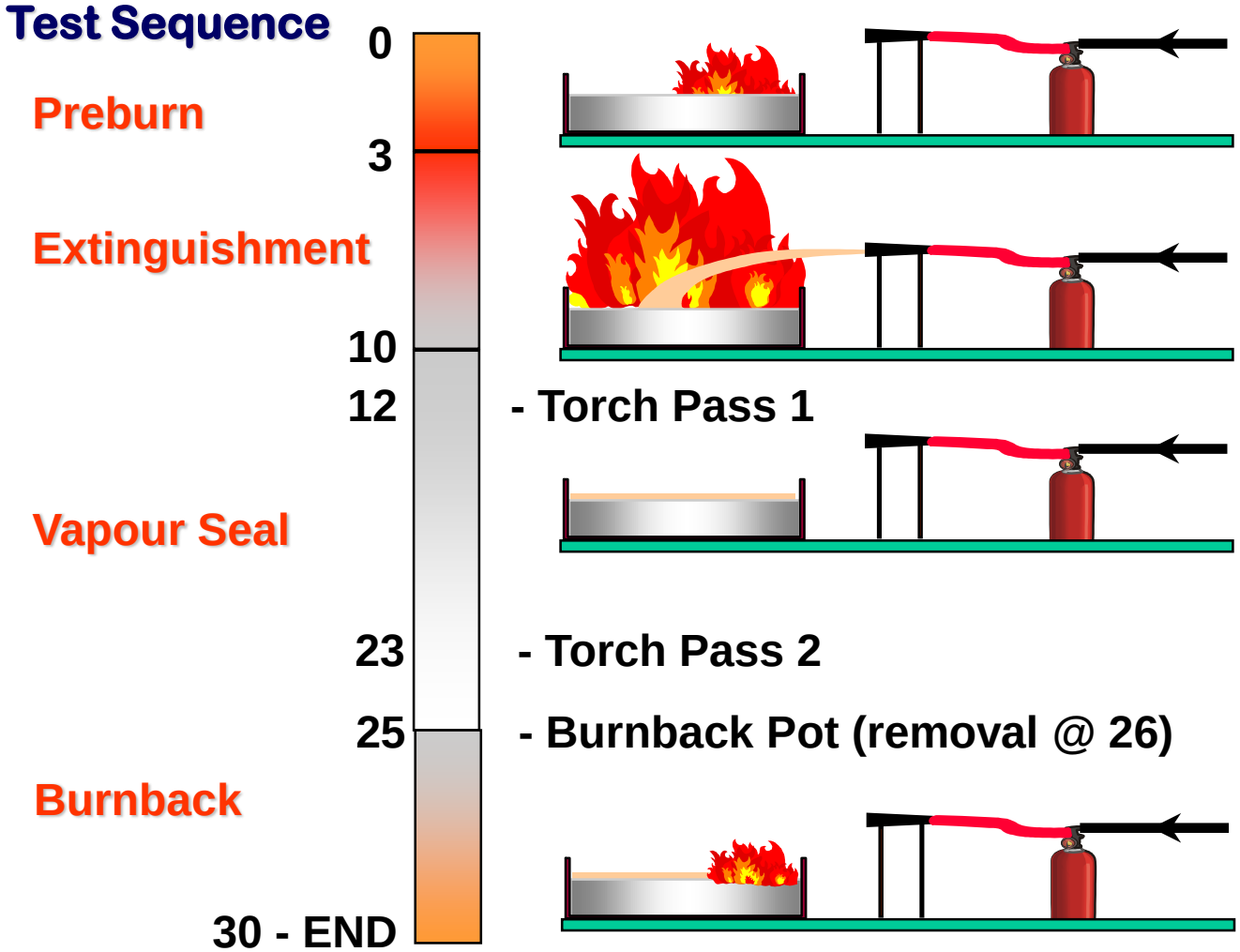
Large freeboard
2.44m Diameter
Fire Test Pan

## Test Sequence

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We are seeing differences in performance!!
Still appropriate if application techniques, devices and rates remain the same

# Not the end of the story!

**Other issues**

Physical Properties

Proportioning rates

Stability

Materials compatibility

Full environmental effect details

Disposal

All of this applies to some extent whatever the foam change – FF or C6 or other!


Does it provide similar foam quality with site equipment? Expansion and Drainage Time?

# We have been through the problems before


# Will the foam proportion correctly?


High Viscous Foam - connected IBC's
8x accelerated movie

# We have been through the problems before

Will the foam concentrate be stable?

Will it degrade?

Accelerated ageing?

# We have been through the problems before

Storage material, pipework, valve seats, etc

# We have been through the problems before



## Health and Environmental Effects Data

## CERTIFIED

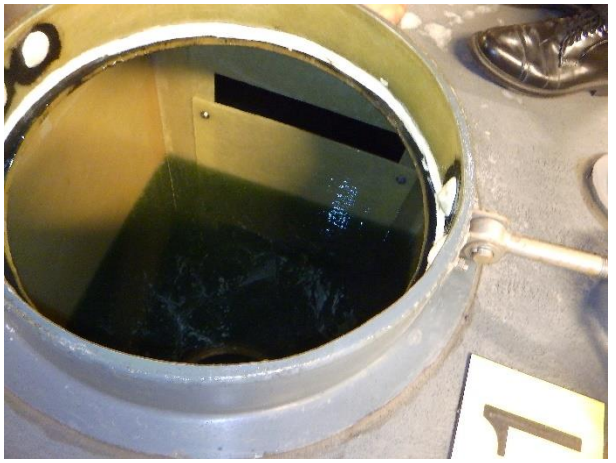
## It takes time

## It is expensive

# We have been through the problems before

Long term availability?
Future additional restrictions?

# We have been through the problems before



## If you have to change

- Procedures
- Criticality of cleaning
- Disposal of old foam?


We probably have to change
Even with Fluorosurfacant foams
with lower C chain

An opportunity
Cradle to Grave Approach
Not just actual use

- Training
- Testing
- Containment
- Disposal


Developing an
Assurance
Protocol

# Firefighting Foam

## Do we have a crisis?

No crisis but a crossroads

And an opportunity and challenge!!

Get it right for the long term

So look on the bright side!

# Firefighting Foam

crisis?

No crisis

And

So look