



ABB LIMITED

Planning for Decommissioning

A demolition mans point of view

Steve Andrew - Head of Late Life, Decommissioning and Demolition



Introduction

Steve Andrew

- Lead ABB's core Late Life, Decommissioning & Demolition Team
- 40 years industry experience
- Responsibilities for the preparation and planning of decommissioning and demolition projects and typically being lead representative of the CDM Principal Designer and Demolition technical advisor
- Member of the institute of demolition engineers and incorporated member of the Association of Project Safety (Principal Designer)
- Recent events reinforce the importance of events like this to share learning and experiences
- Today's presentation to share experiences – **the ten things I wish I had known when I started!!**

ABB Services in this area

- Project management across full project lifecycle
- CDM preparedness (UK Decommissioning)
- Safety / health and environmental management
- Decontamination / decommissioning / mothballing
- Asset inventory Assessment
- Hazdem / Hazid / Envid – Pre Dismantlement
- Asset reuse and relocation
- Design reroutes / isolations of services (electrical, instrument and mechanical)
- Structural studies to ascertain safe methods of dismantling and demolition
- Procurement and contract management
- Site divestment services



What is decommissioning

Myths and legends

Different things to different people depending on industry



The ten things I wish I had known!

One - Decommissioning is only Construction in reverse?

Construction

- New equipment
- Confidence in construction
- Laydown area
- Status of isolation
- Design / information

Known

Decommissioning

- Restricted access / live equipment
- Condition of equipment / structures
- Other peoples bad practice
- Vessel weights / lifting equipment
- Residues materials
- Insulation
- Isolation / stored energy
- Information provided

Unknown condition = Hazards and risks

The ten things I wish I had known!

Two - Perception that all sectors are different – Consequence of getting it wrong?

| Issues | Onshore | Offshore | Nuclear | Maritime |
|--|---------|----------|---------|----------|
| High Hazard Processes | Y | Y | Y | Y |
| Hazardous Residues / Raw Materials | Y | Y | Y | Y |
| Hazardous Insulating Residues (Asbestos) | Y | Y | Y | Y |
| Radio-Active Substance (NORM) | Y | Y | Y | Y |
| Large Unique Structures | Y | Y | Y | Y |
| Tanks, Pipes & Vessels | Y | Y | Y | Y |
| Strict Regulatory Regime | Y | Y | Y | Y |
| Environmental Receptors | Y | Y | Y | Y |
| Deep Water | Y | Y | Y | Y |
| Difficult Access | Y | Y | Y | Y |
| Reputation / Stakeholder Management | Y | Y | Y | Y |

The ten things I wish I had known!

Three – This is new and never been done before



- 600te of NORM contaminated equipment
- Radio Active Catalyst
- 1600te of Asbestos contaminated equipment
- Phenol contamination
- Working in and among live plant

1,2,3 Ammonia

Octal Phenol

Live plant

Asbestos / radio-active catalyst

Oil and Gas Plants

Asbestos removal / catalyst recovery

Phenol Plant Demolition

Major asbestos removal /
contamination

Urea 5

Lift and shift

Storage

The ten things I wish I had known!

Three – This is new and never been done before



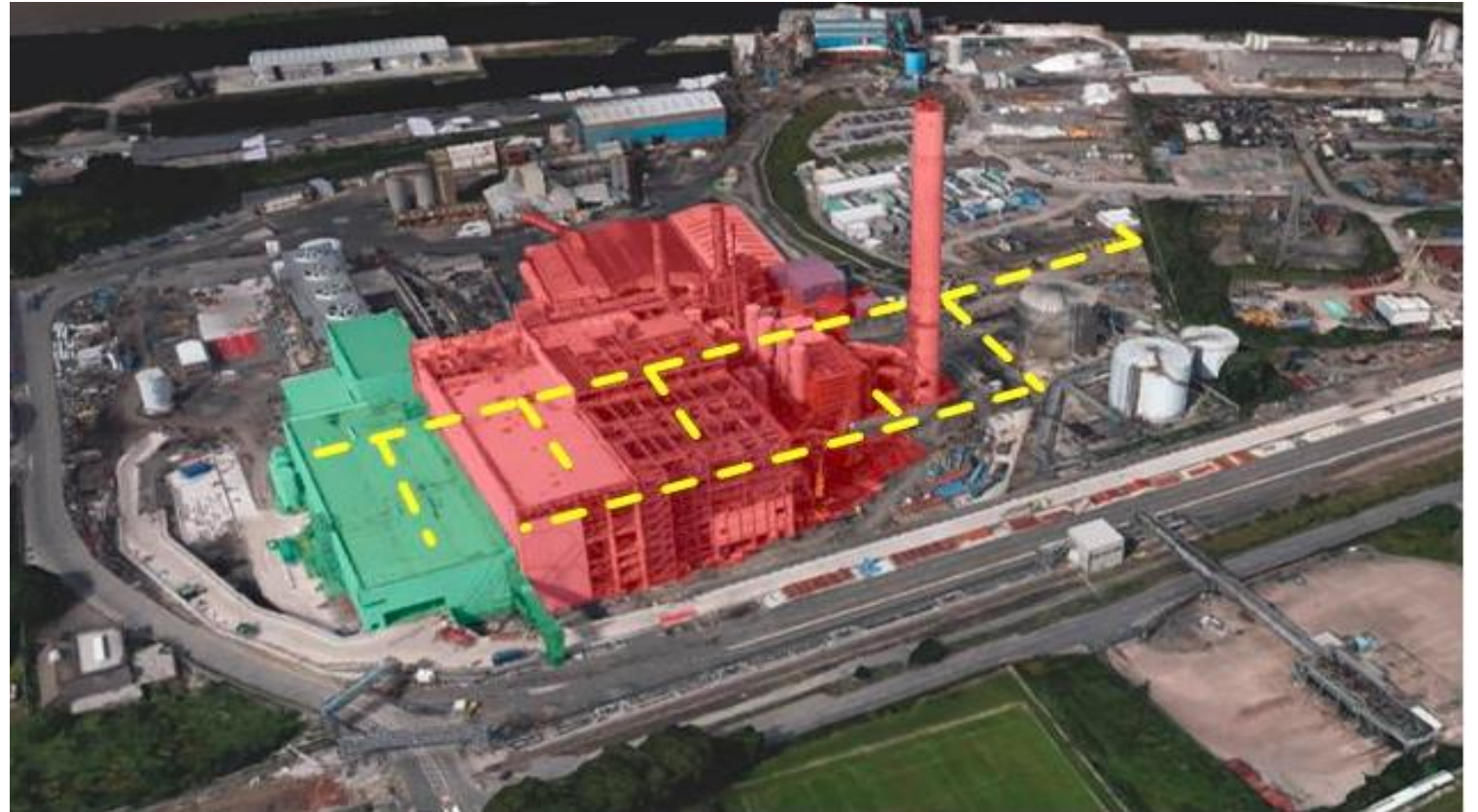
The ten things I wish I had known!

Four – Design for decommissioning/derisking

Issues

- Working in and around live plant
 - Risk to people
 - Environment
 - Operations - business interruption
- Hands on methodology
- Interfaces with live operations
- On going maintenance costs

■ - Live areas
■ - Redundant plant and equipment areas
■ - Live Services



The ten things I wish I had known!

Four – Design for decommissioning/derisking

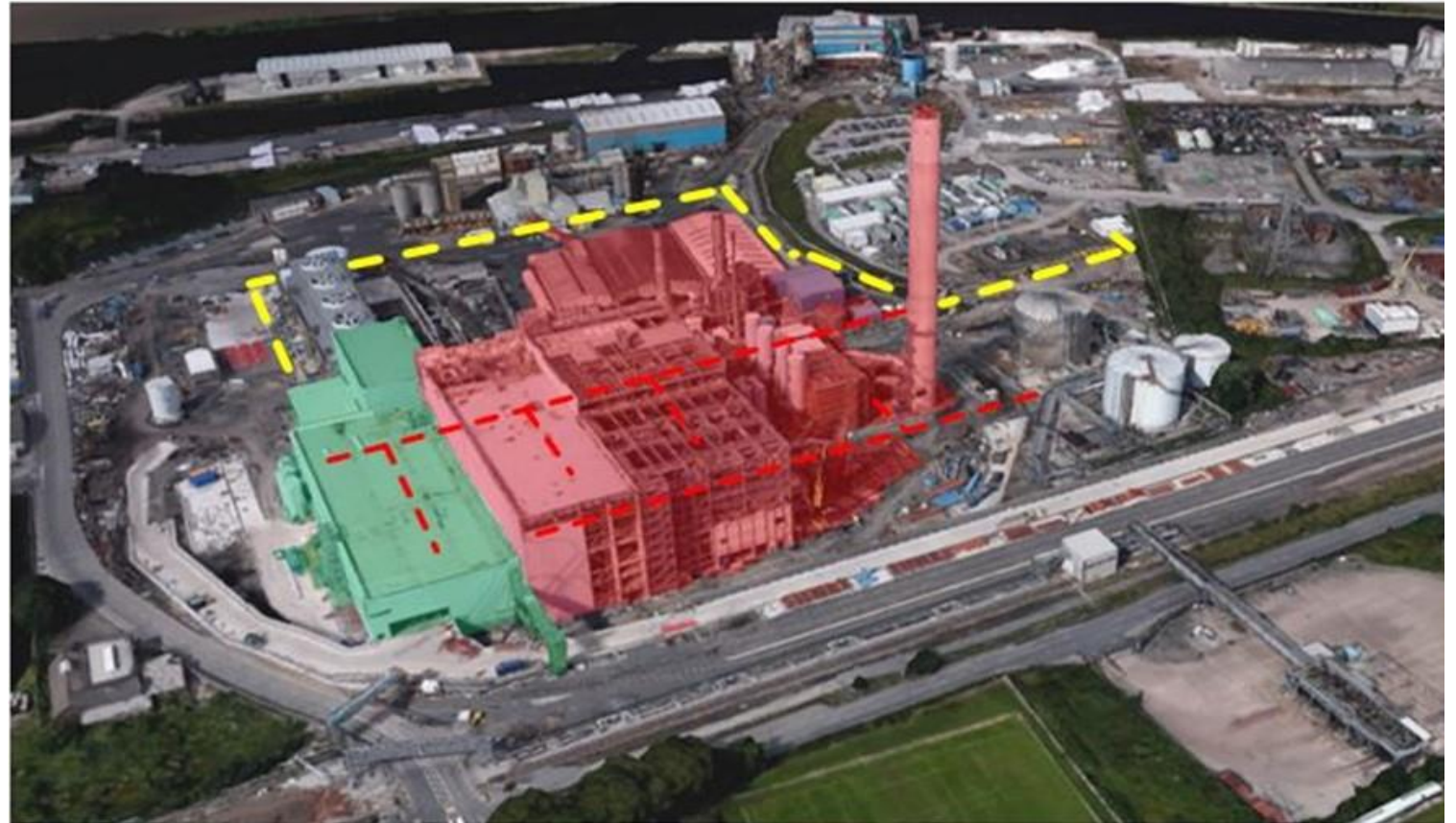
Reroute live equipment away from demolition area

Benefits:

- Building inherent Safety into process
- More remote methodology - machine v man
- Less interface and risk of business interruption
- Significantly reduced ongoing maintenance costs

Cost neutral!

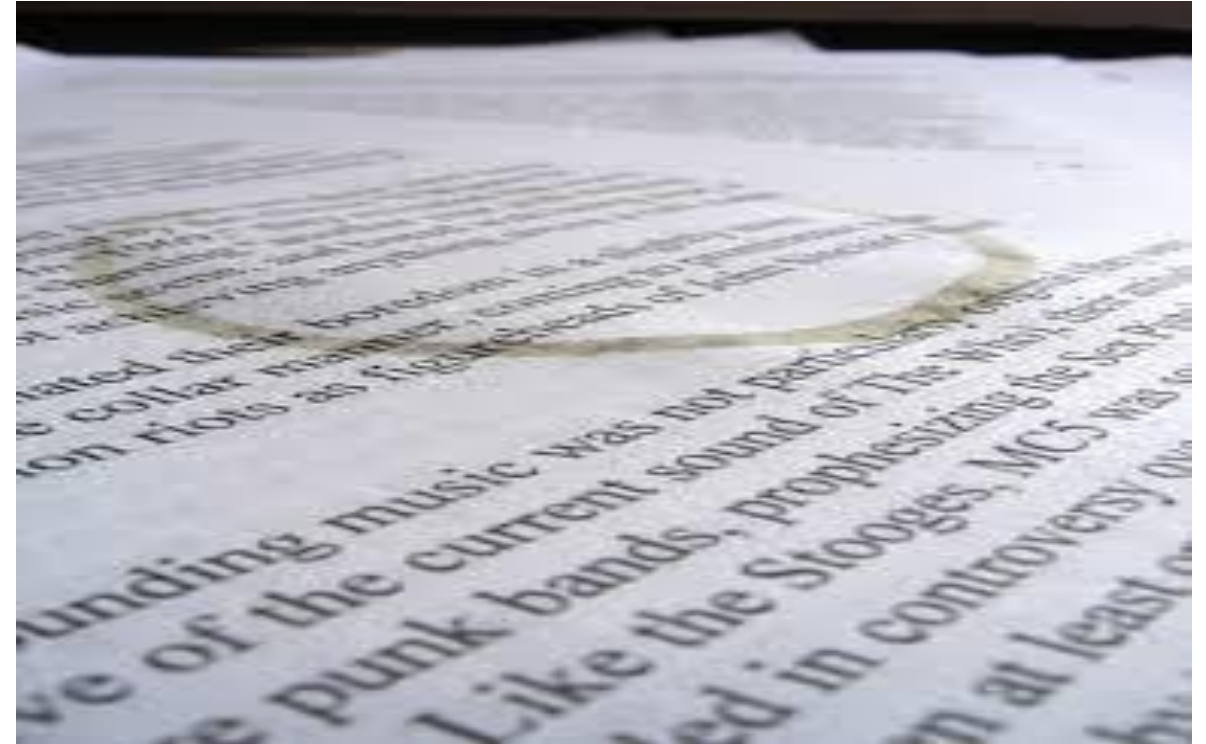
■ - Live areas
■ - Redundant plant and equipment areas
■ - Live Services



The ten things I wish I had known!

Four – Design for decommissioning/derisking

- The Client had already tendered the project
- ABB to re-scope the project and re-tender
- Reviewed the information provided to the prospective Contractors
- All the risks on the project had been passed on to the Contractor and there were a number of information gaps
- Further studies were carried out and the project re-tendered – HIM's, PCB's, Underground services
- After a bid review and clarifications
- The credit increased by over 1,000% paid to the client
 - Contractor awarded additional phases of work
 - More importantly no accidents or incidents



Do stuff!
And can we have it back next week?

The ten things I wish I had known!

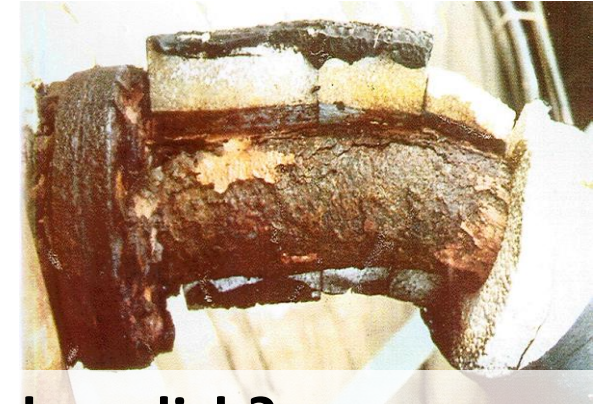
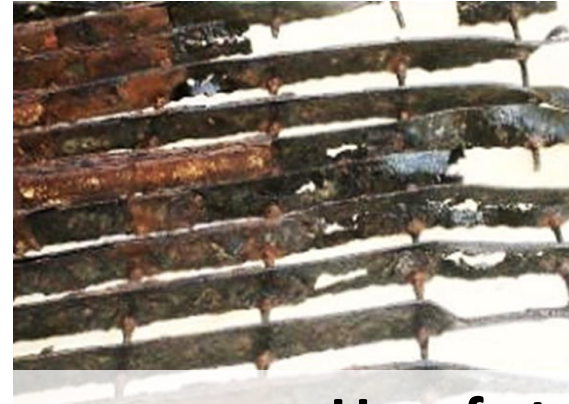
Five – Records / Information

- Keep all information:
 - As built, Inspection records, P&IDs etc.
 - Construction (Design and Management) Regs – provide information
 - Traceability
 - “We believe everything you tell us, yet we believe absolutely nothing.”
- In the event of delayed decommissioning capture the knowledge before it gets lost
- Three types of information on projects of this type:
 - Know – information you can trust
 - Unknowns – information where you know you have gaps
 - Unknown unknowns – stuff you don’t know about yet = SHE / Commercial risk

The ten things I wish I had known!

Six – things always take longer than you expect

- Everything takes considerably longer than you would expect. Planning requirements / legal compliance
- Internal processes - approvals
- Management of Change - not normal operation - effect of doing things differently
- The sooner you remove the redundant assets after the closure the better,
 - It never gets cheaper
 - Becomes unsafe to demolish



Unsafe to demolish?



The ten things I wish I had known!

Seven – things do go wrong

- “Don’t worry, it will be all right we know what we are doing”!
- **“Its ok we have always done it this way”**
- YouTube
- Lessons learned
- Appointing the right suppliers with the required:
 - Skills, Knowledge, Experience
 - Competence
- Question what you don’t believe or understand



Are you sure?

Decontamination

Eight - How clean is clean?

- Different mind set
- Most cases not trying to protect asset value
- What is “clean”?
- Capture knowledge of key people before you lose them

Unknown plant status to known status

= Reducing the RISK



The ten things I wish I had known!

Nine – building the right team

- Identify key people early - incentives to stay
 - Losing corporate knowledge
- Peoples behavior changes
- Loss of key resource can prevent you from following existing processes
- Regulator interest

“You will knock a nail into wood with a hammer but you probably would not use the same hammer to take it out again”

source unknown

The right people, with the right knowledge, at the right time

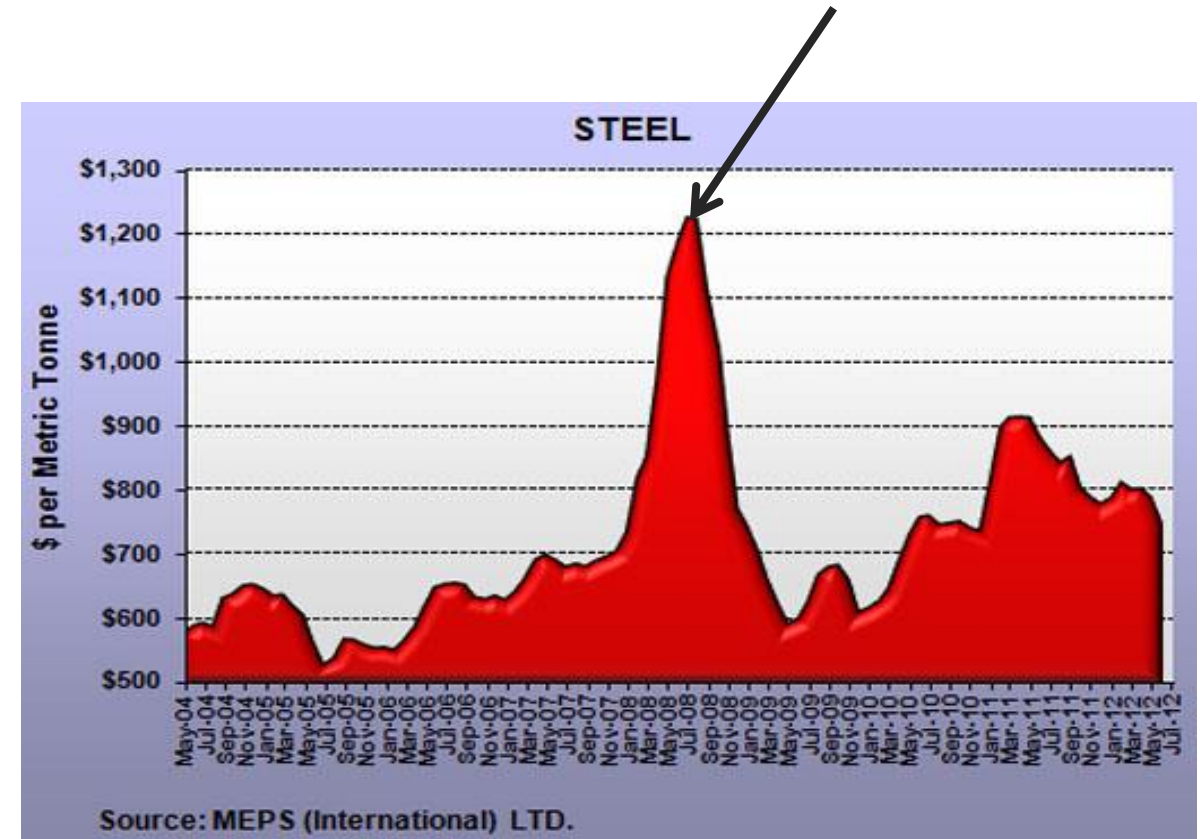
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Ten - Commercial Arrangements

- Gain Share v Fixed Price v Time & Materials
- When was the Chinese Olympics
- The price can go down as well as up
- Who takes the risk – derisk = better benefit to everyone
- Short term gain long term pain

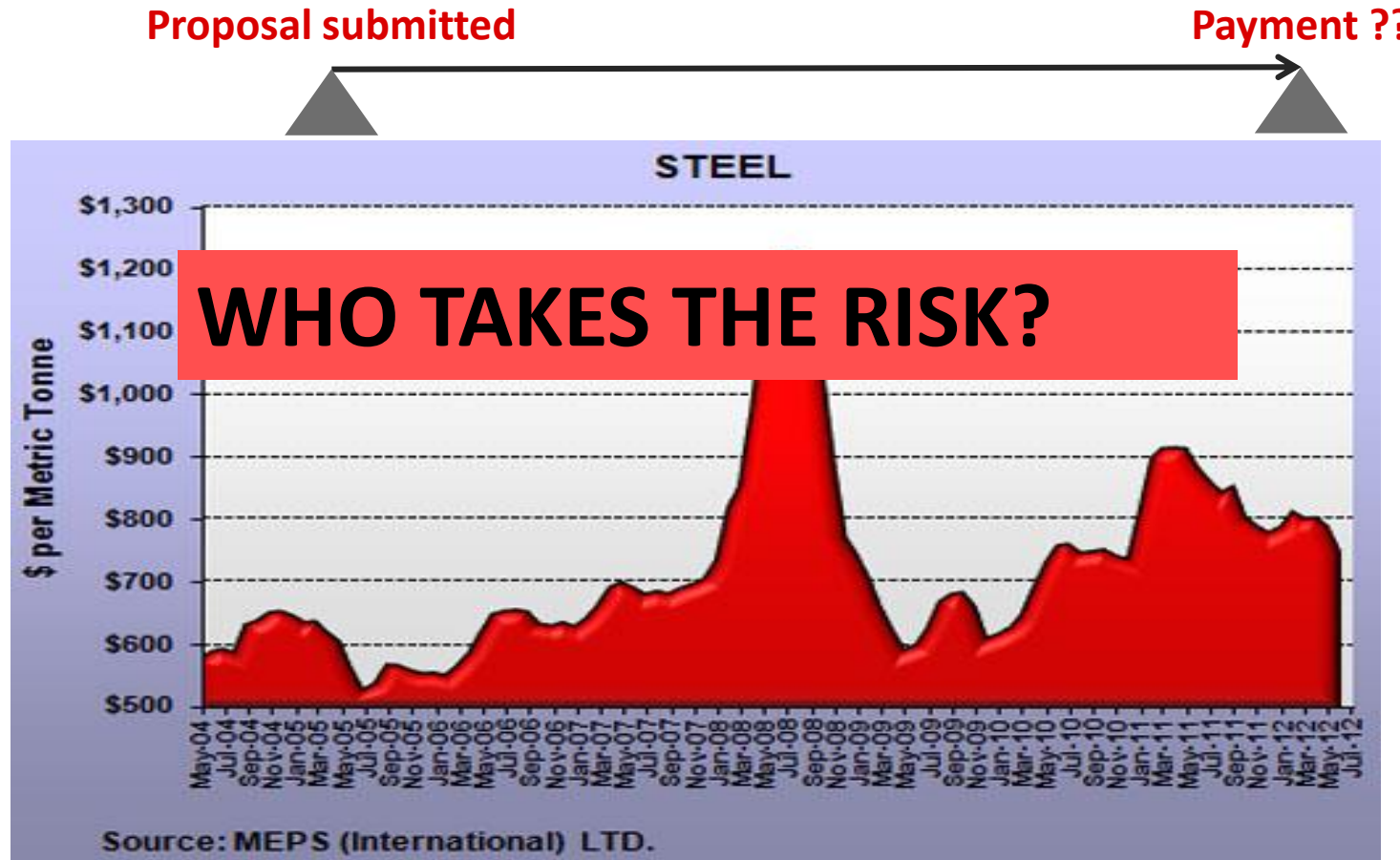
Tender periods

- Short timescales, can drive bad projects and not get best value
- Expectations on tender documentation



The ten things I wish I had known!

Ten – Commercial Arrangements



Summary

- The process is not new, but all projects are different and will have their own specific issues!
- You would not employ a pipe fitter to install your control system!
 - Right people,
 - at the right time,
 - with the right information.
- In decommissioning delay only increases the hazards, risk and cost
- By engaging early and designing for decommissioning it will result in the costs coming down, reduced risk and improved SHE performance.

Summary

- "Those who don't know history are destined to repeat it." Edmund Burke (1729-1797)
- “We are born with a bag of luck and no experience, the trick is to get the experience before you run out of luck” – Unknown
- “Learn from the mistakes of others because you will not live long enough to make them all your self” - Unknown

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