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Implementing Lean Manufacturing at Siemens Magnet Technology.

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Agenda

- Who are Siemens Magnet Technology & what do they produce ?
- What is the business issue?
- The Solution
- The Project
- Overview of the Manufacturing Process
- The Model
- Outcome

- Demonstration

Siemens Magnet Technology

- Manufacturer of Magnetic Resonance Imaging Equipment (MRI)
- Non-invasive imaging technique to obtain cross-sectional images of the body
- Introduced in the early 1980's
- Increasing use in diagnosis of cancers, heart disease and neurological disorders
- UK site produces the superconducting magnet for both Siemens and other suppliers
- More than 30% of MRI Scanners world-wide use Siemens' magnets

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The Business Issue Facing Siemens Magnet Technology

- History of excellence (technical innovation & quality of supply)
- Five different types of magnet produced
- Increasingly competitive market
- Cost of manufacturing had to be reduced
- Inventory levels identified as too high & lead times too long
- Large physical size and weight of magnets creates storage/handling issues

- … but delivery performance had to be maintained

The Solution

- Replace existing batch production system with a “Pull” system
- Introduce kanban methodology and make only when triggered
- Not straightforward due to nature of some stages of manufacturing
- … so
  - How to specify?
  - How to prove performance?
  - How to convince production & planning staff?

The Project

- Five major production areas – each with own Process Manager
- In-house Concept Design Process Maps already developed
- These extended to include numerical data (e.g. process timings)
- Model would imitate Process Map style to aid familiarity
- Numerous meetings with Process Managers (individually and in groups)
- Many detail operational issues resolved before model build started (not unusual !)
- Model validated by individual process areas and by responsible Process Manager
- Overall responsibility and on-site co-ordination by Planning dept.

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Overview of Manufacturing Process - 1

- Five basic stages
- Coil Winding, Resin Impregnation, Coil Preparation & Termination, Assembly and Testing
- Five magnet types broadly split into two manufacturing streams (A&B) reflecting work content

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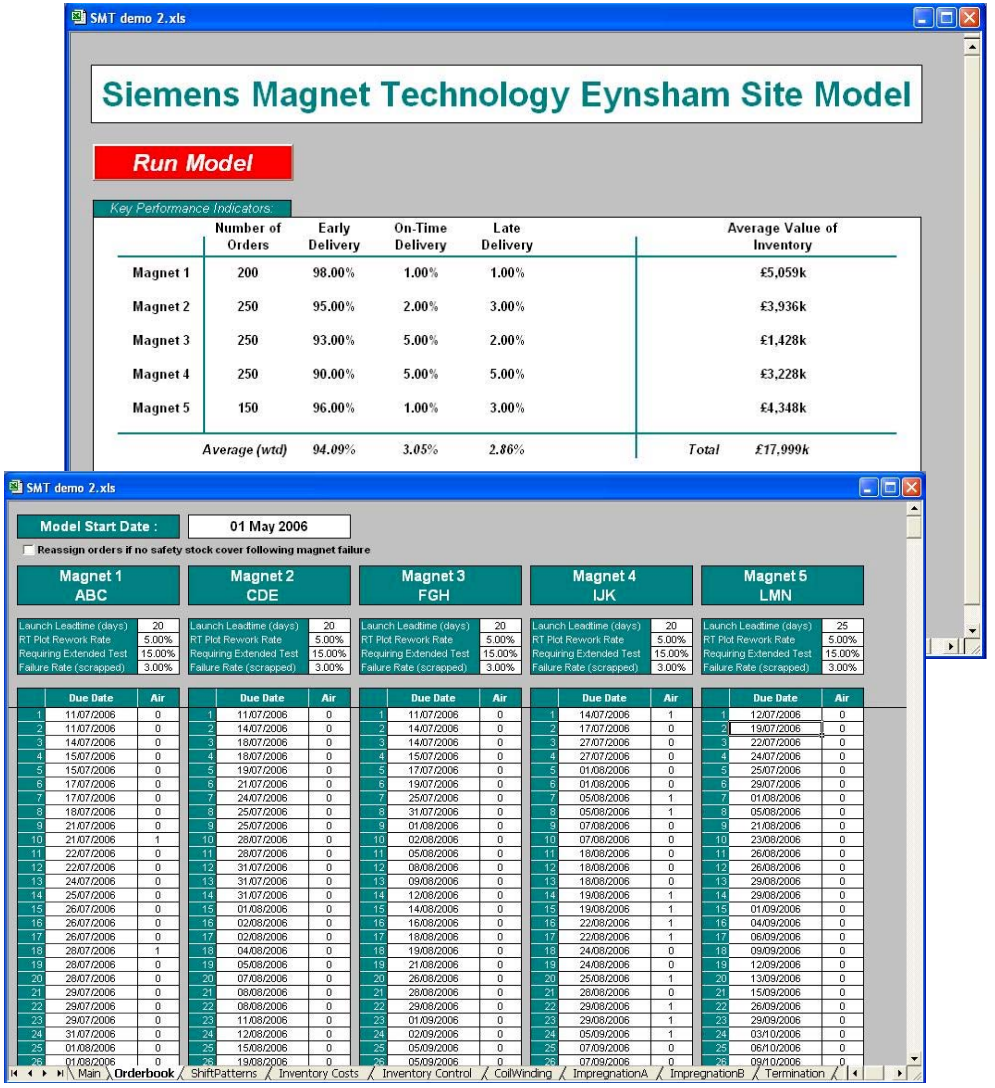
Overview of Manufacturing Process - 2

- Some magnet types have dedicated manufacturing equipment at certain stages but all share equipment at some stage
- Certain stages are labour intensive (e.g. Coil Winding) whilst others are capital intensive (e.g. Resin Impregnation)
- Differing approaches needed to maximise local efficiencies

The Model - 1

- Conventional Witness model linked to MS Excel Workbook
- Model driven by forecast demand for magnets
- Order launch lead times, product quality data, kanban sizes and process timings all configurable from Excel



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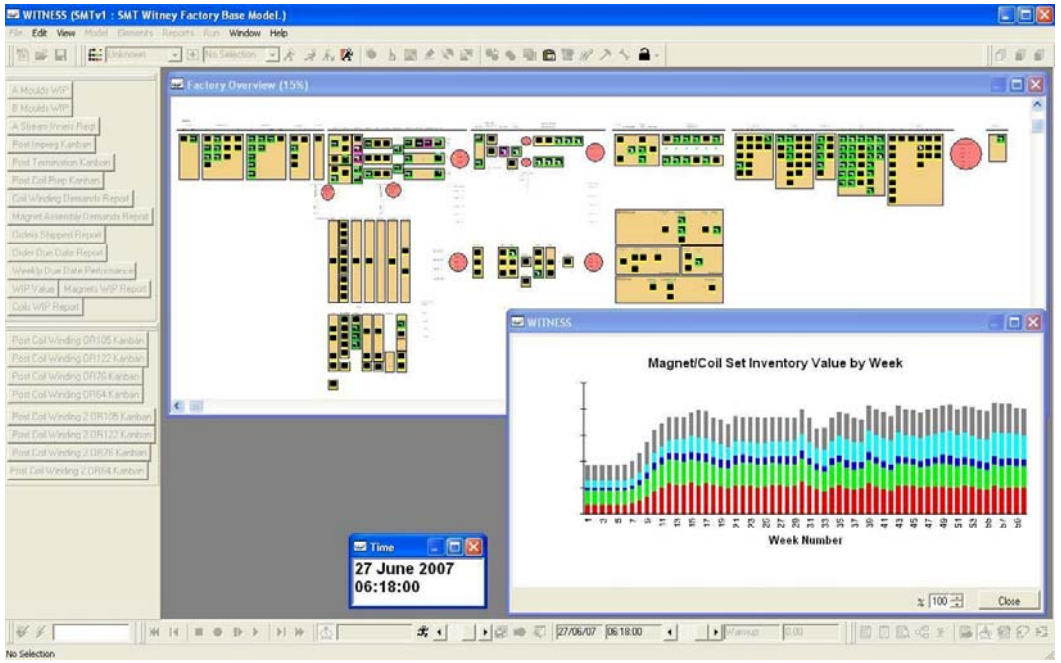
The Model - 2

- Limited high level reporting fed back from the model to Excel
- Most reports held in Witness and predominantly displayed in graphical form
- Key reports are order due date performance and anticipated inventory levels (both in financial and unit terms by magnet type)



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Outcome

- Original design had too few kanbans
- Significant cross blocking of magnet streams
- Major negative impact on throughput & lead-times
- Later used to size kanban operation
- Specified location and numbers of safety stock magnets
- Now to be updated and used quarterly to ensure rules and trigger points remain optimal

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Demonstration

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