Overview of case studies: Thailand



Case study: Thailand – PTT Chemicals (High Density Polyethylene (HDPE) plant) (March 2011)

Summary

- Example of application of the ISO methodology: Chemical company producing high-density polyethylene (HDPE) for use in plastics industry, packaging, electrical appliances, construction industry etc.
- Credits
  - TISI Project team: Ms. Chaowalee Ratanamungmeka, Director of Standardization Promotion and Development Bureau, Ms. Nopporn Klum-Em, Ms. Boonsri Hanesopa (project asistants)
  - Consultant: Mr. Prakob Petcharuttana (safety consultant)
  - Mr. Reinhard Weissinger, ISO, Manager, Research, Education, and Strategy

The company – 1

- Chemical company producing high-density polyethylene (HDPE)
- The company serves mainly the plastics industry
- The company produces one type of product and is a production facility. It was therefore decided to limit the case study to one business function:

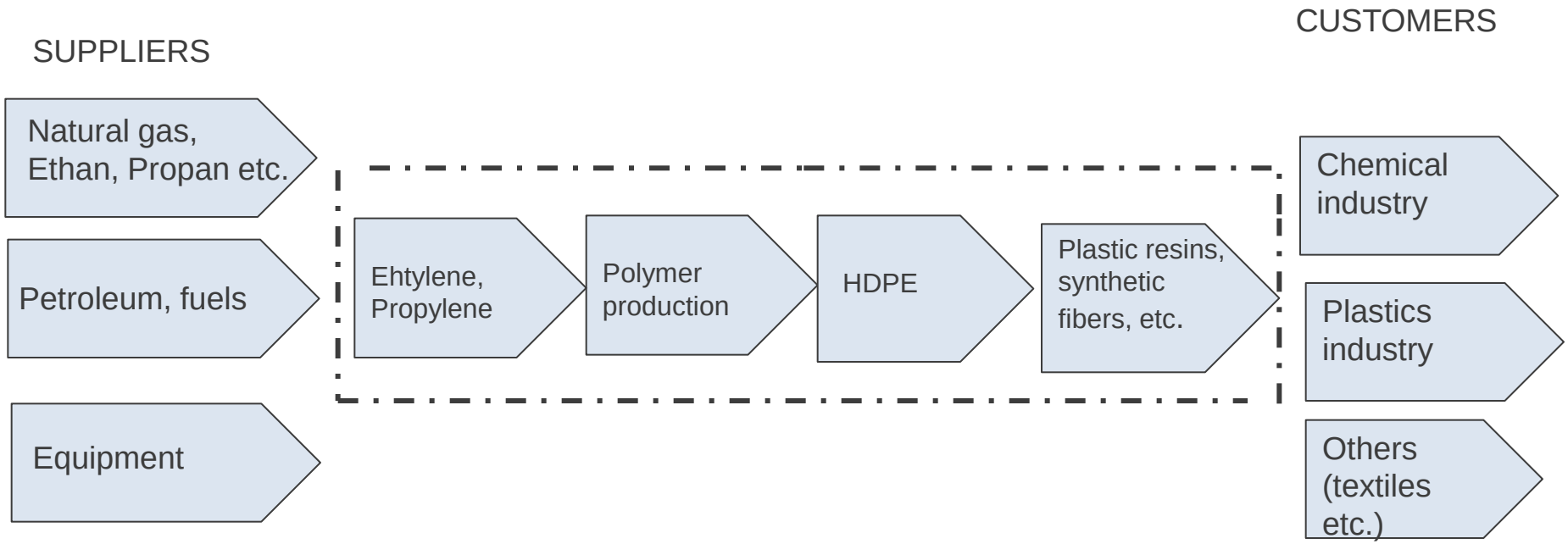
  Production

- The company operates only domestically and has no export sales.

The company – 2

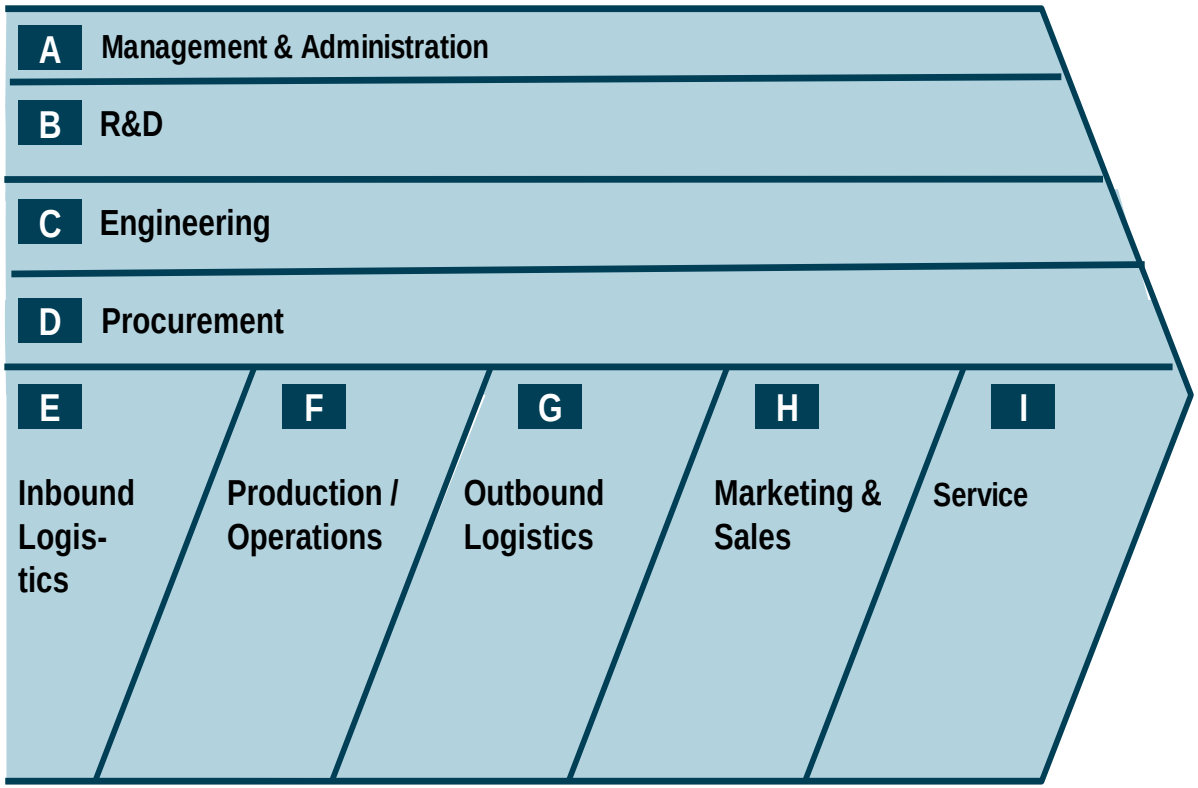
- The company in its current form was established in December 2005 and started its production operations during 2005
- The design of the company and of its technology processes have been bought from Mitsui and are used unchanged
- The company has close to 1,400 employees
- The annual production capacity is around 270,000 tons of HDPE

Industry value chain



= In scope

Model of a company value chain (M. Porter)



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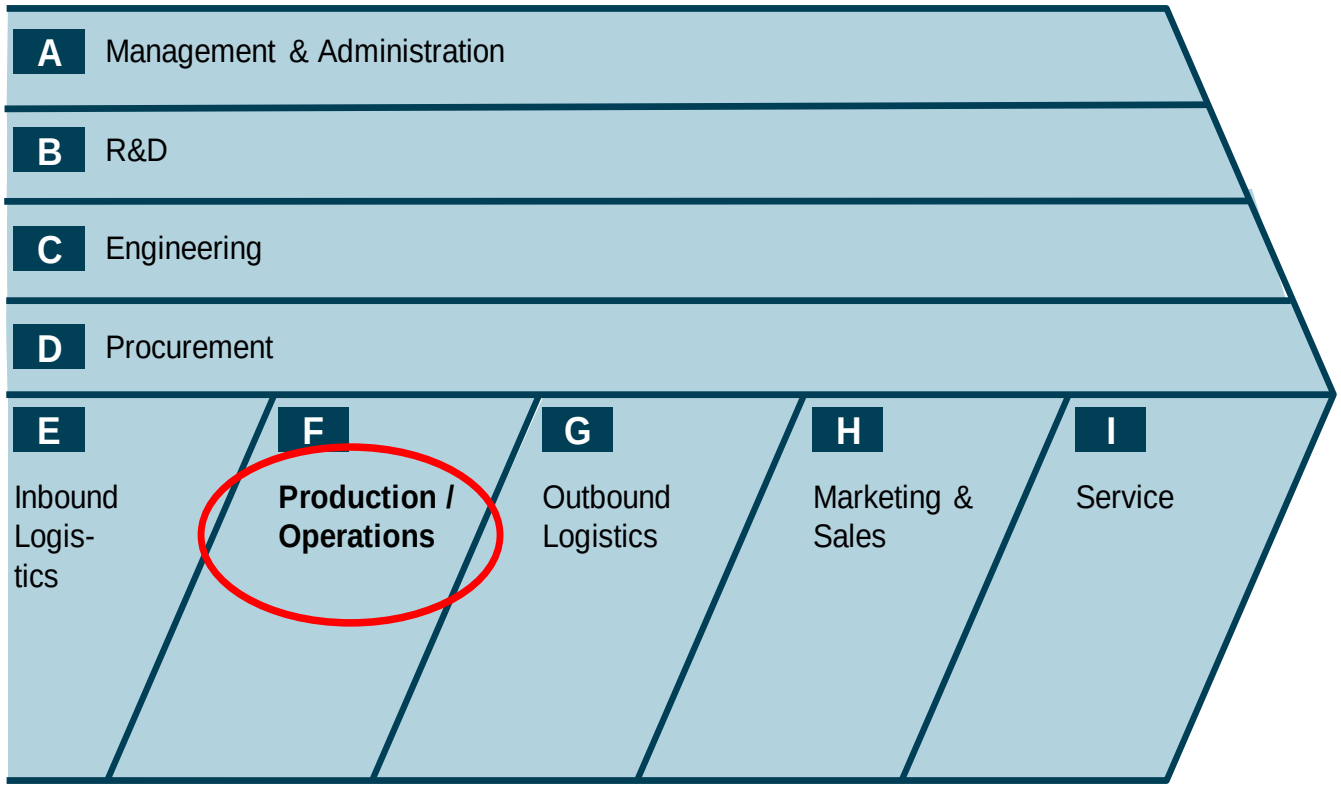

= Focus of the assessment

Preliminary analysis of the Standards Impact

- The company has a library of several hundreds of technical standards, primarily product and test standards. More than 90% of them are external standards (ASTM, SAE, API, ISO and the national standards of Thailand, TIS). ISO 9001, ISO 14001 and OHS standards (18001) are throughly applied since the start of the operations of the company in 2005.
- Based on preliminary analysis and as a consequnce of the type of company as a production company, the business function most significantly impacted by standards is **Production**
- It was therefore decided to limit the assessment to this business function.

Production (1)

- In the production function standards are used extensively
- A distinction is made between
  - Product standards (containing product requirements)
  - Process standards (mainly management system standards for quality, environment, health, occupational health and safety)
  - Engineering standards (testing and standards for the plant operation)

Production (2)

- Due to a systematic application of the management system standards, it was possible to improve the performance of the plant, reduce the shut-down times and save on inputs such as ethylene and energy.
- The assessment compares the situation in 2005 (first year of operation) with that in 2009 and relates the improvements to the intensified use of the management systems that re-inforce the other standards (engineering and product standards).

Calculation of standards impacts in production (1)

- Standards impact 1: **Increase in plant availability and reliability**

Indicator	2005	2009
Production (Tons/Year)	200,097	270,244
Plant reliability (%)	94	99,66

The higher plant reliability/availability resulted in a marginal gain of around **USD 4,6 million** due to increase in output

Calculation of standards impacts in production (2)

- Standards impact 2: **Reduction in non-conforming product** (“OFF-specification” product)

Indicator	2005	2009
Production (Tons/Year)	200,097	270,244
OFF-Spec (%)	1.64	0.26

The reduction in OFF-spec products resulted in savings of around **USD 0,3 million**

Calculation of standards impacts in production (3)

- Standards impact 3: **Reduction in etyhlene consumption**

Indicator	2005	2009
Production (Tons/Year)	200,097	270,244
Ethylene consumption (Tons)	1.033	1.024
Ethylene price (USD/Ton)	700	700

The reduction in ethylene consumption resulted in savings of around **USD 1,7 million**

Calculation of standards impacts in production (4)

- Standards impact 4: **Reduction in energy consumption**

Indicator	2005	2009
Production (Tons/Year)	200,097	270,244
Energy index (Kcal/kg PE) [PE = polyethylene]	604	487
Energy index (kWh/Ton)	702.32	566.27

The reduction in energy consumption resulted in savings of around **USD 2,8 million**

Calculation of the total EBIT impact of standards for the selected operational indicators - Production

Business Function: Production	EBIT impact
Increased plant reliability (savings)	4,6 MUSD
OFF specifications (reduction/savings)	0,3 MUSD
Ehylene consumtion (reduction/savings)	1,7 MUSD
Energy (reduction/savings)	2,8 MUSD
Total	**9,4 MUSD**

- This corresponds to around **3%** of the annual sales revenue of the company

Thank you for your attention!

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