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SABIC INDUSTRIAL WASTE WATER MINIMIZATION

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E&PM

Engineering and
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الشنون الهندسية وإدارة المشاريع

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INTRODUCTION

Saudi Basic Industries Corporation was established in 1976 to add Value to Saudi Arabian's natural hydrocarbon resources.

Vision

To become the world's preferred manufacturer and marketer of chemical and metal products.

Mission

To provide high-quality industrial products and services to customers, meeting the expectations of shareholders through optimum utilization of available human and natural resources and state of the art technologies, following safe, environmentally sound and ethical practices.

INTRODUCTION

- SABIC has 18 world-scale manufacturing Affiliates in Saudi Arabia.
- Recently SABIC has established Shared Services of which Engineering & Project Management (E&PM) is a part.
- As of today, SABIC is one of the largest petrochemicals manufacturer and among the world's market leaders in the production of Polyethylene, Polypropylene, Glycols, Methanol, MTBE & Fertilizers.

INTRODUCTION

- SABIC devotes substantial resources to protecting the environment.
- SABIC is always looking for new ways to become cleaner and greener organization with the aim of:
 - ❑ protecting air (by designing fuel efficient plant & emissions monitoring program)
 - ❑ protecting water (through technologies that recover, recycle and reuse water)
 - ❑ protecting land (by monitoring groundwater water at manufacturing facilities and the condition of the soil, manufacturing environmentally friendly goods).

INTRODUCTION

- SABIC Engineering and project management (SABIC E&PM) is one of the SABIC shared services that provides:
 - Effective world class project management
 - Specialized technical support for process engineering to SABIC Affiliates
 - Project services and engineering expertise services to SABIC Affiliates for electrical, mechanical, instrumentation & control systems and civil.

BACKGROUND

- Due to the booming industrial development in the middle east, the percentage of fresh water consumption for industrial purposes is increasing rapidly.
- Water conservation forced the evaluation of various options to reuse waste water.
- SABIC E&PM took up Industrial Waste Water Recycle Program (IWWRP) to evaluate the best possible options to recycle waste water as make up water within SABIC Affiliates, thus reducing the consumption of make up water and minimizing the disposal of industrial waste water that will be treated.

BACKGROUND

➤ Water Consumption and Waster Water Generation Data for SABIC Affiliates (Jubail) are as follows:

Potable Water Consumption	96000 m3/day
Waste Water Generation	42696 m3/day

➤ Waste water from SABIC plants are presently being disposed off to a Central Treatment Facilities for processing.





MAJOR DRIVERS FOR THE PROJECT

- Follow government trend to minimize fresh water consumption and wastewater disposal.
- Be ready for future expected stringent environmental regulations.
- Become a role-model and pacesetter for IWW Recycling program Kingdom-wide.

UNIQUE APPROACH

- The traditional approach of reusing waste water is to install a modern 'End of pipe' treatment system.
- This has the following inherent disadvantages particularly for Petrochemical industries.
 - 1) The treatment becomes difficult due to presence of various kinds of chemicals that are inherent in Petrochemical Industries.
 - 2) The treatment cost become very high
- E&PM has taken a unique approach of **in-process solution** i.e. identifying water reuse, recycling and regeneration opportunities within the process. This approach is new to the industries and will overcome most of the problems faced in applying 'End of pipe' treatment system.

ACHIEVEMENTS

- In Affiliate-1, opportunity of recycling 35 t/h waste water has been identified. **This will save 2.0 MMSR per annum.** 
- In Affiliate-2, higher blow down from steam drum in one of the plants has been identified. Also recirculation system with suitable filter has been suggested for pelletizing unit to reuse the overflow water. **Total saving shall be 3.37 MMSR per annum.** 
- In Affiliate-3, opportunity has been identified to recycle 120 t/h waste water as DM water by introduction of resin bed. Also recycling of 30 t/h vented low pressure steam has been identified by condensing and treating. **Expected saving will be 10 MMSR.** 
- In Affiliate-4, opportunity has been identified to recycle 190 t/h waste water as DM water by introduction of resin bed. **Expected saving will be 13 MMSR.** 

Findings

- Discontinuous waste water generation found to be significant

Affiliates	Total waste water quantity, t/h	Discontinuous waste water quantity, t/h	% of Discontinuous waste water quantity
Affiliate-1	179.2	84.72	47.2
Affiliate-2	420	175	41.66
Affiliate-3	248	55	22.17
Affiliate-4	120	52.5	43.76
Affiliate-5	150	17	11.33

- Method has been suggested to monitor discontinuous waste stream generation.

CONCLUSION

- The traditional approach of solving Industrial waste water problems with End-of-Pipe treatment need to be reconsidered.
- **In -Process -Solution** is recommended as a powerful and practical way to solve increasingly severe problems faced by industry with respect to the cost of waste water treatment and the availability & cost of fresh water.
- SABIC E&PM has taken up IWW program and has applied **In - Process - Solution** to SABIC Affiliates. Study has been completed so far for five Affiliates and significant opportunities for waste water reuse have been identified.
- These opportunities are based on macro-review and our next step is to do micro-review for further waste water minimization

Thank You !

E&PM

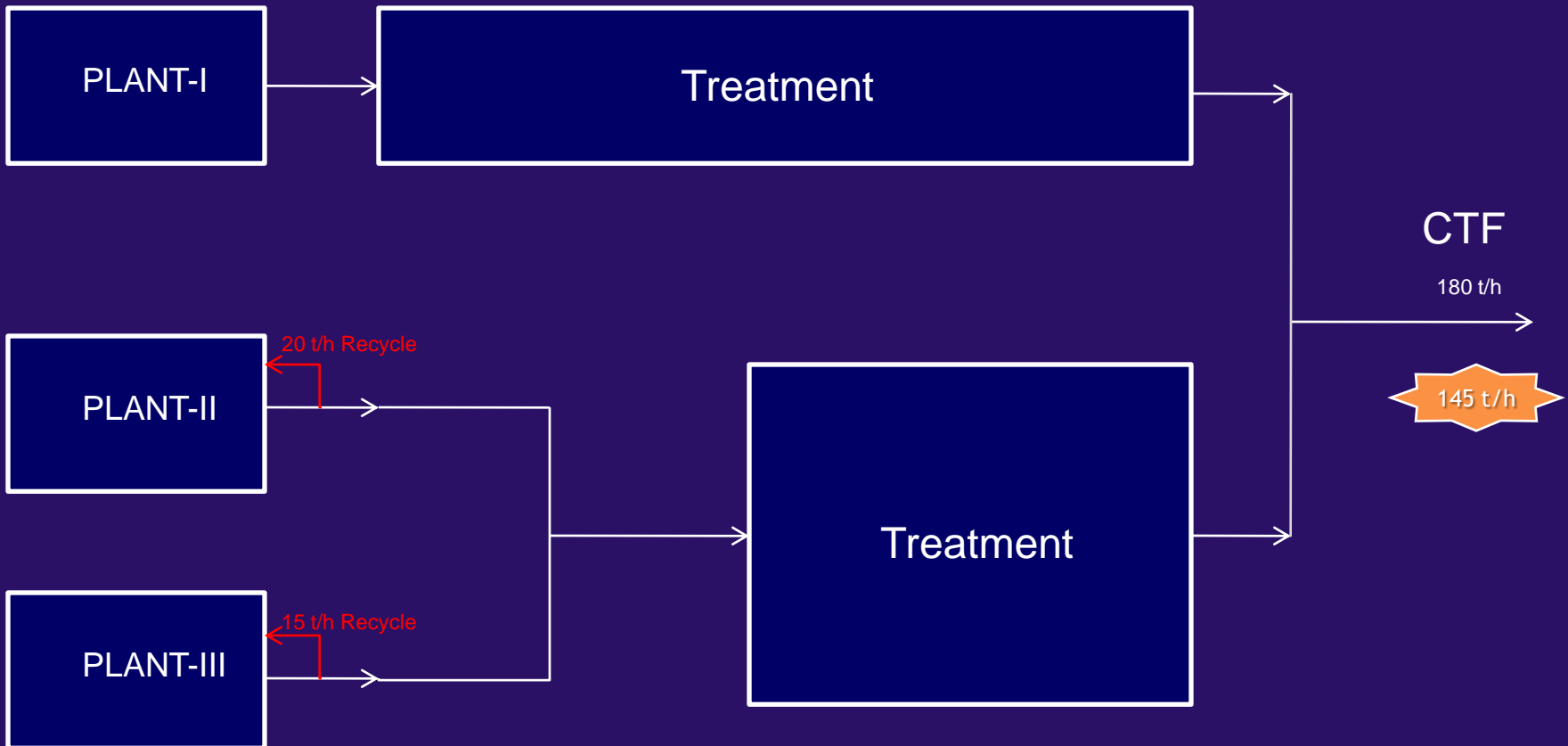
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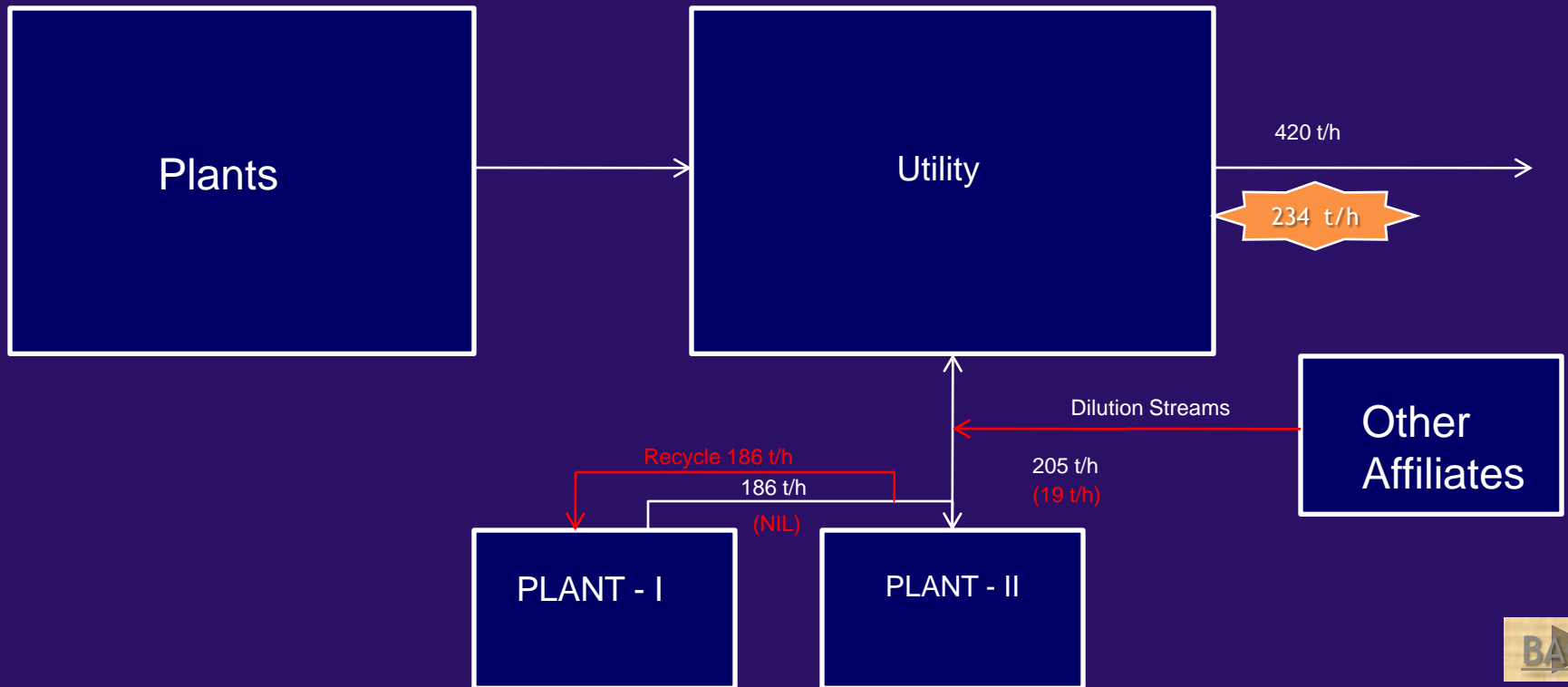
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AFFILIATE-1 COMPLEX

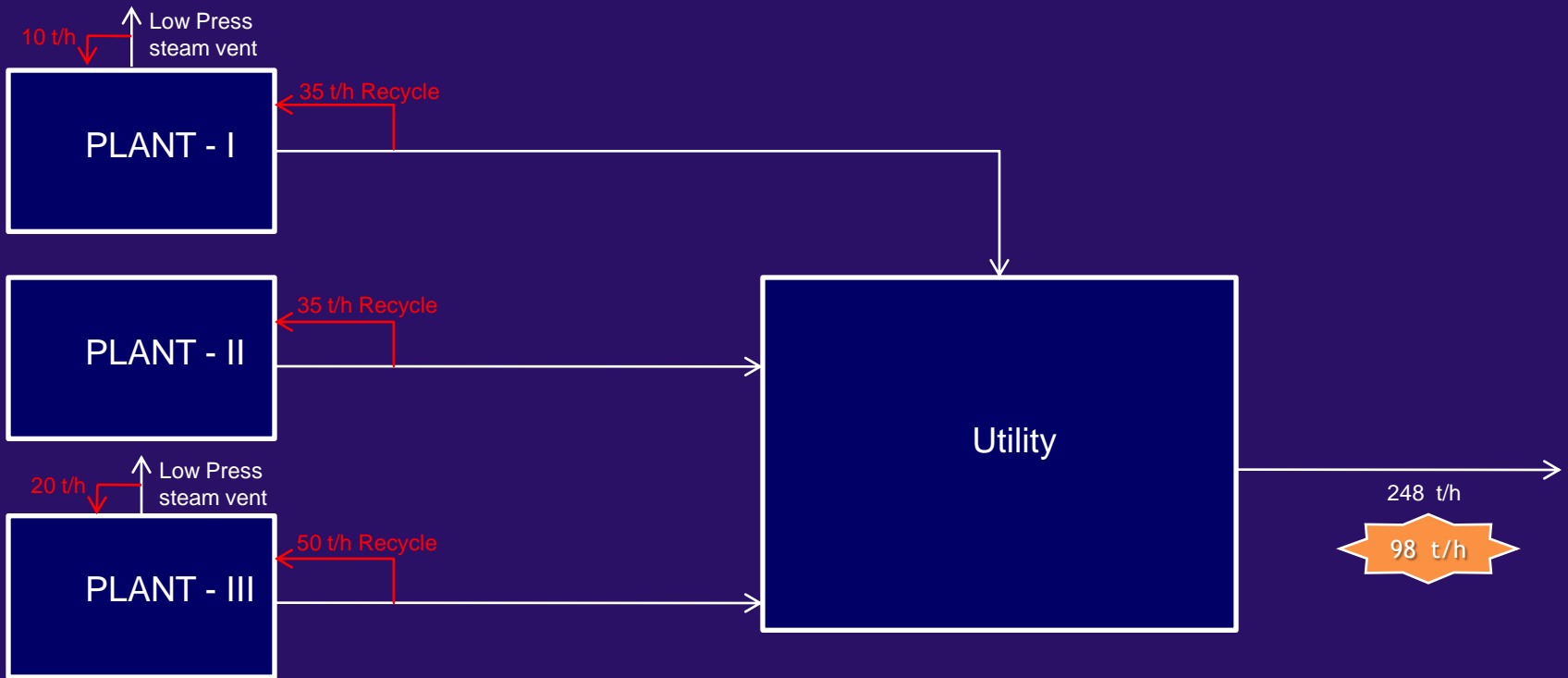


AFFILIATE-4 COMPLEX



BACK

AFFILIATE-3 COMPLEX



AFFILIATE-2 COMPLEX

