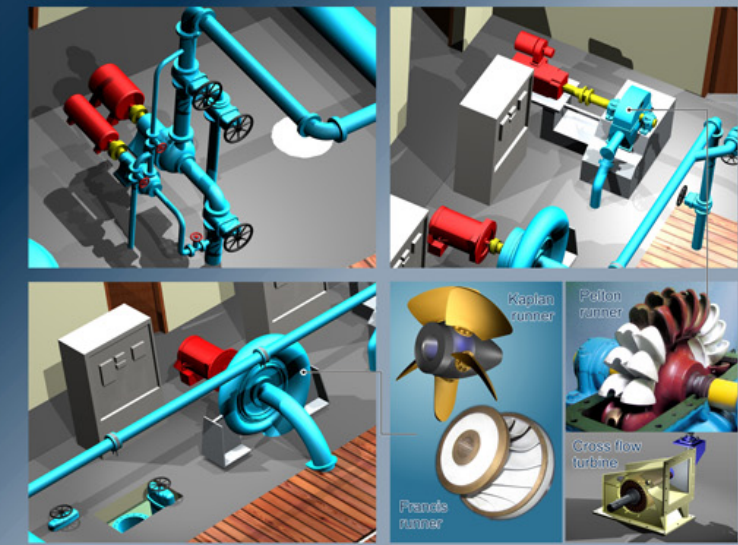
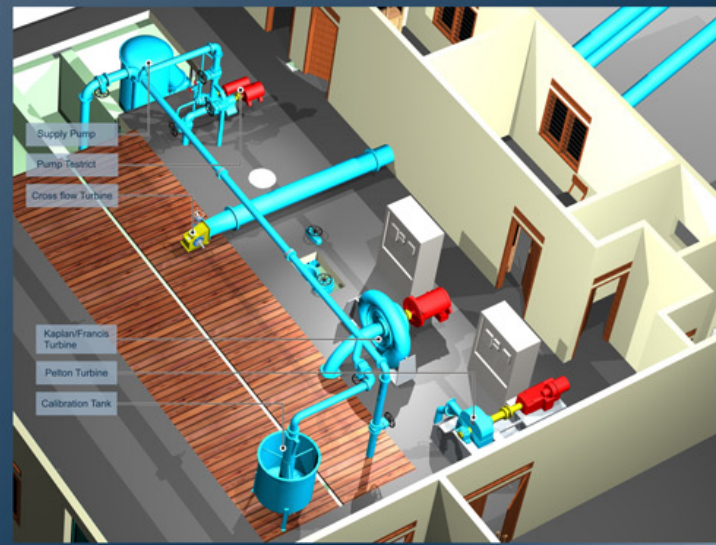


HYCOM
ASEAN HYDROPOWER
COMPETENCE CENTRE



Website: www.hycom.info



HPNET - WEBINAR

28.3.2019

- **Training**
- **Experience Exchange & Networking**
- **Development and Research Assistance**

to the Small-Scale Hydropower Sector



was established in 2011 with the support of:

- **University FH Technik (Zuerich)** - *Laboratory equipment*
- **REPIC – renewable energy platform Swiss** - *Shipping costs*
- **ASEAN Center for Energy (ACE) and the German International Cooperation (giz)** – *PPP supporting construction costs*
- **TEDC, Technical Education Development Centre** (as well called PPPPTK-BMTI) – *Providing land in TEDC compound*
- **Entec AG and PT. Entec Indonesia**) – *Design and implementation*
- **Giz/CIM** – *supporting integrated expert to establish HYCOM*

The ASEAN-HYCOM is a private public partnership and is operated (self financed!) by a consortium between:

- TEDC, Technical Education Development Centre (as well called PPPPTK-BMTI), Bandung
- PT. Entec Indonesia



HYCOM's target groups and potential customers are private and public sector actors and educational institutions actively involved in MHP development:

- Equipment manufacturers, suppliers, consultants
- Lecturers, trainers and students from private and state universities, vocational schools and other educational institutions.
- Mini hydro associations
- Operators and managers of MHP plants
- Regional, bilateral and national MHP support programs
- Political decision makers and representatives of Government departments
- Potential investors and financiers, banks
- Appropriate technology and research institutions active in mini hydropower technology development and dissemination

Since 2018 HYCOM is up-graded to a Renewable Energy Centre (Hydro, Wind, Solar and Bio energy and waste management) and is a certification body for the Indonesian Government on Vocational School Level.



HYCOM offer the following **products and services**:

- Conduction of standard and tailor-made trainings;
- Development of core competencies and qualifications of teachers and trainers (HYCOM is closely linked to TEDC, which is experienced in vocational education and up-grading teachers and trainers in the field of technology and vocation);
- Centre for competence of technicians, supervisors designers etc.;
- Systems of standards, quality assurance, accreditation, and measurement to promote greater quality & efficiency and enhance cost effectiveness of local/regional production of MHP equipment and constructions.

Why to establish HYCOM in Bandung/Indonesia?

Beginning 1991

Bandung is home to about 350 qualified people representing a experience of about

5000 Man/Years

in all aspects of building and operating MHP in the range up to 500kW



Technology Transfer: Activities in Indonesia 1991-2019

Activities:

1. **Turbine** technology transfer
(Cross flow, propeller, Pelton....)
in design, manufacturing,
installation & commissioning
2. Development and introduction of
standardized **Civil** structure
designs
3. Development of **Control**
Technology (DTC, ELC, IGC...)
4. Various appropriate technology for
productive end-use activities
5. **Institutional aspects**



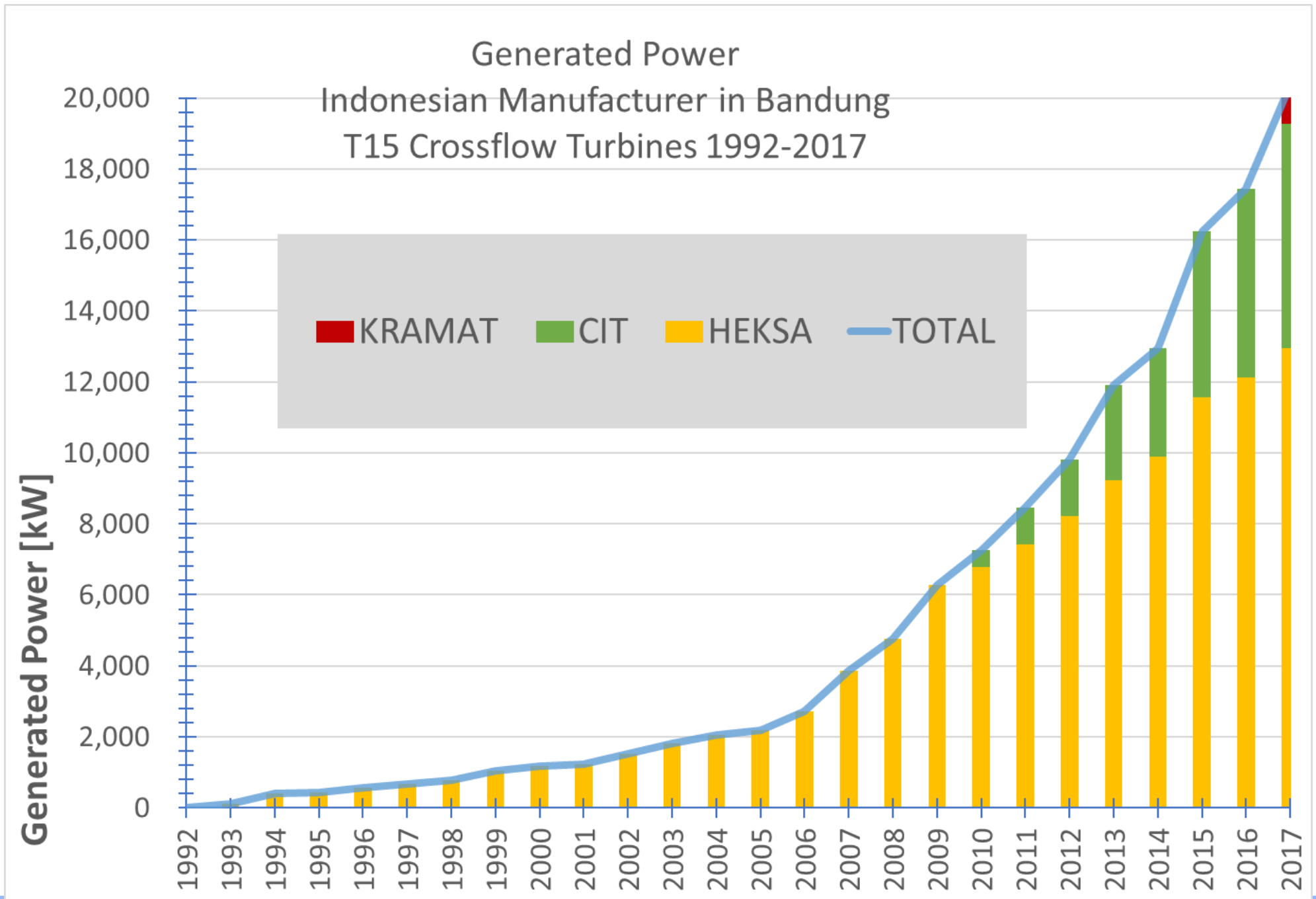
Summary produced turbines as direct result of technology transfer program 1991-2018

Turbine type	Quantity	installed Capacity	
Produced Cross flow turbines T12	70	1,750	MW
Produced Cross flow turbines T14/T15	377	19,500	MW
Produced T15 (license out of Indonesia)	250	15,000	MW
local designes Sumatra+Sulawesi	300	7,500	MW
Produced Pelton turbines	20	1,670	MW
Propeller	101	4,400	MW
Total Turbines produced 1991-2018	1,118	49,820	MW

E&m equipment is exported to other countries like:

England, Swiss, Germany, Philippines, Nepal, Madagascar, Ethiopia, Uganda, Tanzania, Papua New Guinea, Cameroon, Zaire, Kyrgystan , Mozambique, Congo, Nigeria, Turkey, Thailand, South Africa etc.

Total produced Cross flow turbines T12 and T15 in Indonesia



EXAMPLE: Controllers

Beside turbines as well controllers are produced in Bandung. The 2 leading manufacturers produced until 2018

Renerconsys	1040 Controllers	about 40MW
PME	700 Controllers	about 10MW
others	No data	No data

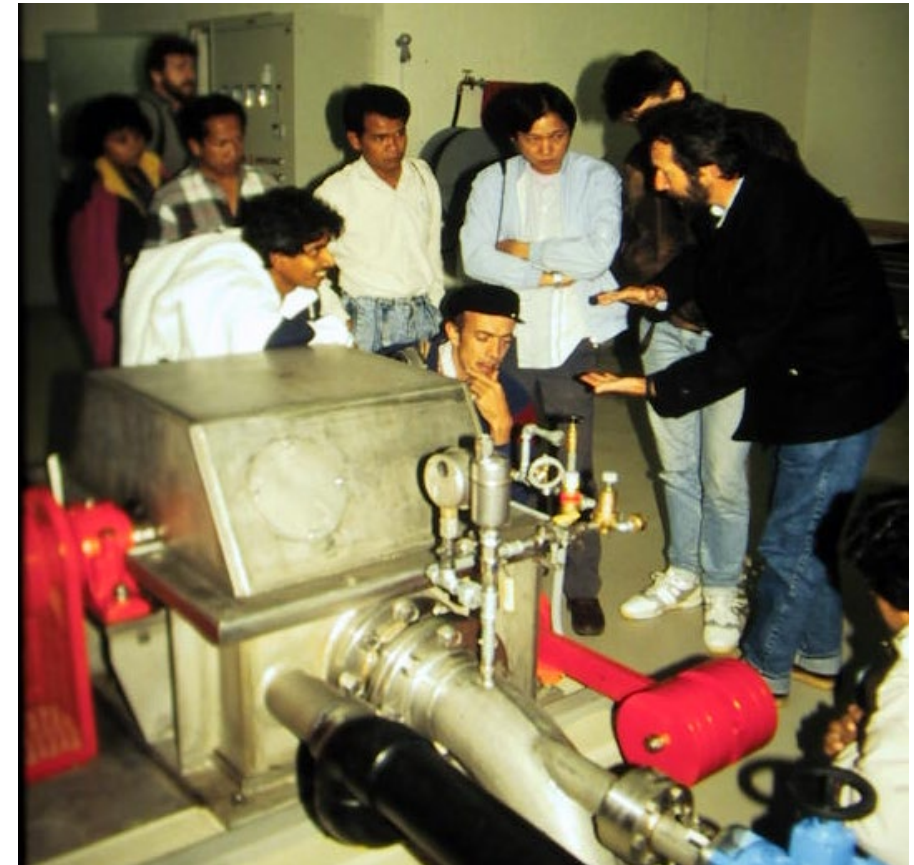
Trainings for the Hydro Power Sector on national and international level have a long tradition in Bandung



But this tradition started earlier:

The deep impact of trainings is proven looking at series of trainings in the late 80s conducted by the **Mini Hydro power Group MHPG** (ITDC, FACT, SKAT, GATE, GIZ) -the predecessor of **Hp-net**

A series of trainings in Nepal, Phillipines and Switzerland (using Universities and Hydro Training centers at that time) supported a decade long development of the micro hydro sector, by bringing together and motivating engineers and technicians.





Shifting of knowledge centres to where they are needed

HYCOM is equipped with Model turbines from a Swiss University Swiss (Pumps, Pelton, Kaplan/Francis) to study characteristics



Grid - Synchronizing Unit with ELC to study Pelton turbine operation behavior during interconnection



Simulation of a stand alone village grid using a Indonesian built **cross flow turbine**. The equipment can be dismantled for **practical operator training**



ELC Load Controller operation and trouble shooting (Village Simulation)



- Strengthening hydro power sector and associations world wide
- International networking and experience exchange
- Improving feasibility studies and design for MHP
- Improving operation and setup of MHP by operator training
- Supporting implementing hydro power standards
- Initiating renewable energy introduction and certification in the vocational school sector
- Supporting expertise for the setup of national Hydro power standards (SNI)
- Preparing the ground for a renewable energy center within TEDC for vocational training in ASEAN

About 500 visitors from all over the world visited HYCOM already





**Our strength:
Offering taylor made
MHP Training Packages**

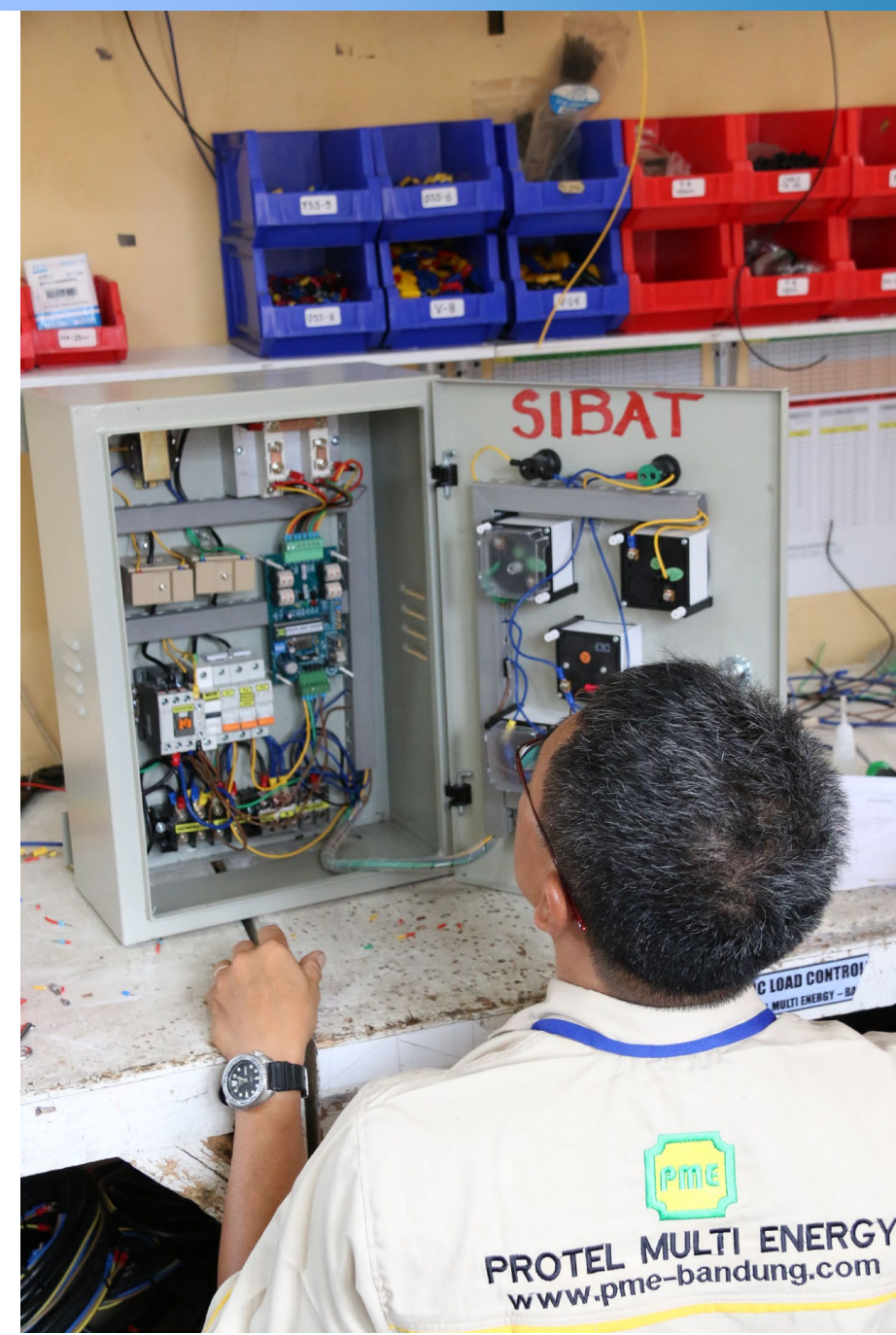


About 300 participants from about 25 countries participated in **workshops** and trainings



EXAMPLE: HP-net ELC Load Controller operation and trouble shooting training





Examples of HYCOM Training Modules

The various training modules offered comprise comprehensive knowledge of and practical exercises on the following topics:

- 01 – Introduction to MHP & Best Practices
- 02 – Management of MHP Projects
- 03 – MHP Project Development
- 04 – Operation and Maintenance of MHP Schemes
- 05 – Site Identification for MHP
- 06 – MHP Feasibility Study
- 07 – Equipment and Turbine Fabrication for MHP

- (see www.hycom.info)



MHP Technology is Supporting Rural Development





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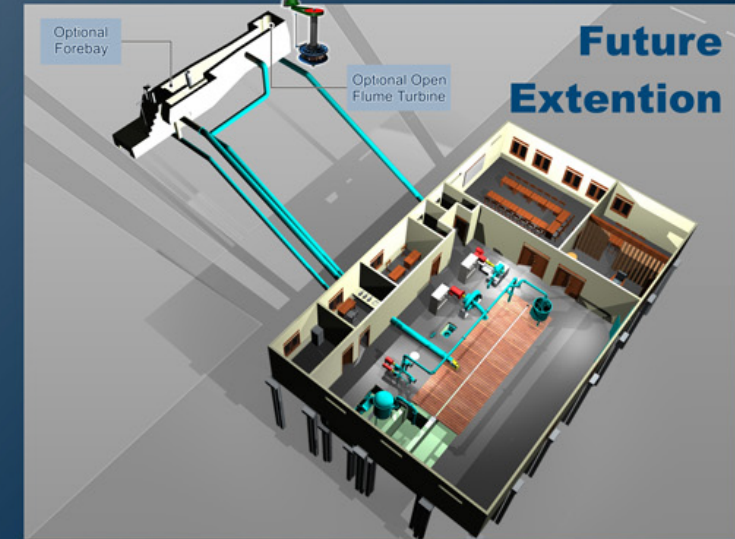
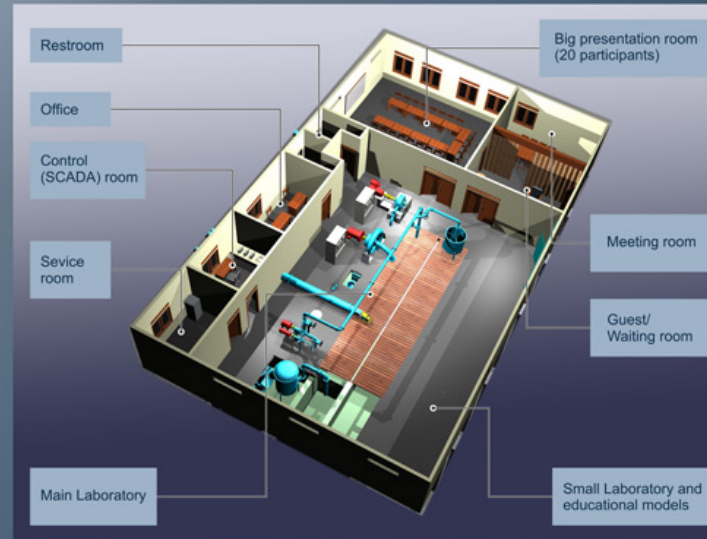
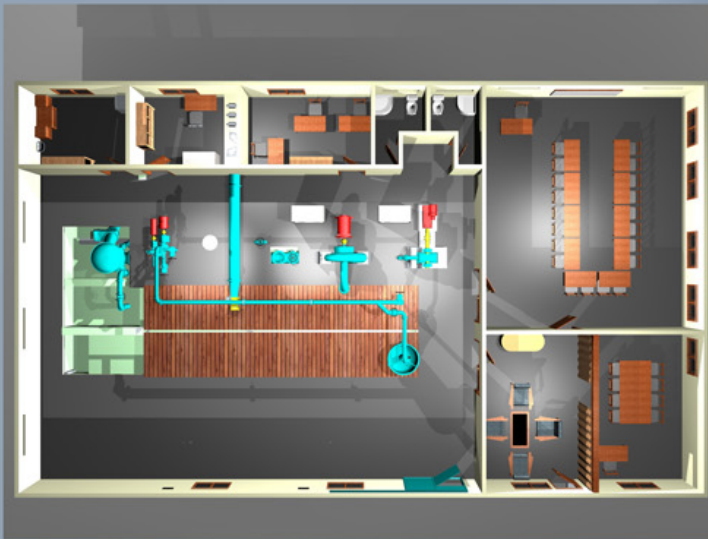
E-mail:
Gerhard.Fischer@entec.co.id
Gerhard.Fischer@hycom.info
Website:

www.entec.co.id

and

www.hycom.info



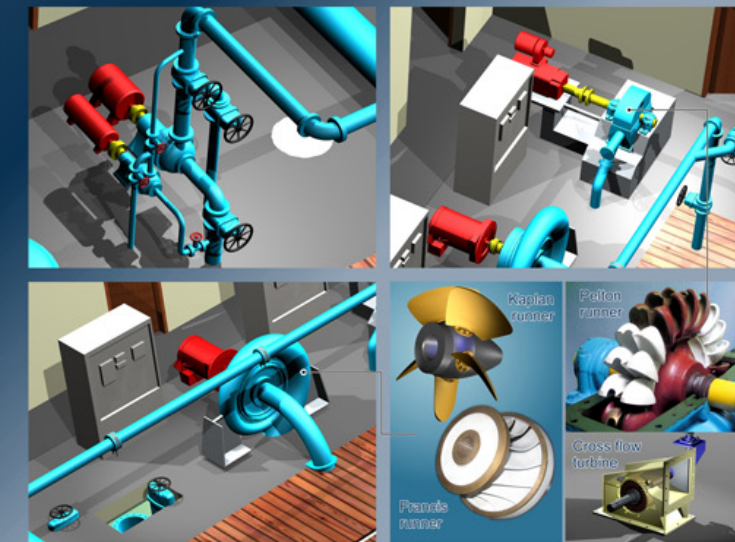
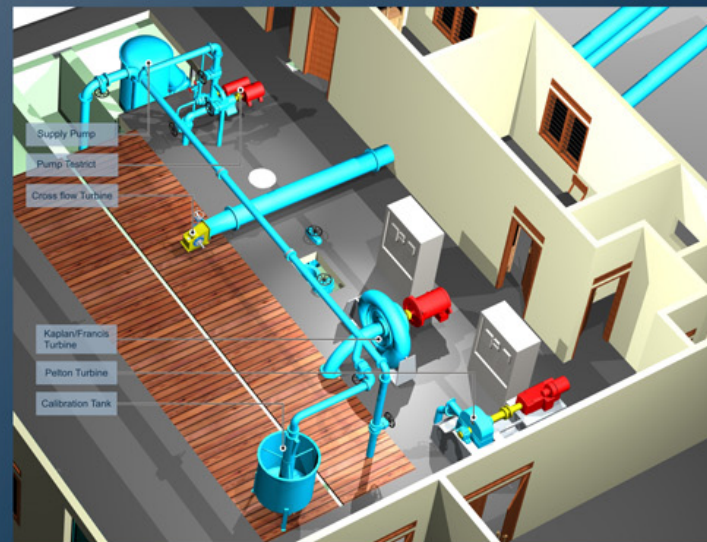


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Pusat Pengembangan dan Pemberdayaan Pendidik dan Tenaga Kependidikan – Bidang Mesin dan Teknik Industri (PPPPTK BMTI)



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