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Basic Design Practices in Seafood Processing Plant and Cold Storage

- Refrigeration is the heart of fish or shrimp processing plant. It all starts with the use of ice from the time of harvesting until it reaches to final consumer kitchen. It is highly necessary to keep the temperature chain intact to keep the quality of the product, whether it is fresh or frozen.



IQF (Individual Quick Freezer)



Plate or Block Freezer

- For a refrigeration plant to work efficiently it is really necessary to have a good processing plant layout. The simple reason is that every part inside the processing plant maintains a lesser temperature than the ambient temperature in most parts of the year. It means the building is energized, even more; appropriate to say that it is refrigerated. This is true for even those plants which do not have an air conditioning system inside the pre-processing and processing area. These areas are getting cooled by the energy given out by the melting of Ice.

Fish collection



Legislations:

EU Legislations:

- **178/2002** - General principles and requirements of Food Law
- **852/2004** - Hygiene Rules of food stuffs
- **853/2004** - Specific hygiene rules for food stuff of animal origin
- **854/2004** - Official controls on animal products
- **882/2004** - Official control to ensure verification of compliance with feed and food law

National Legislations:

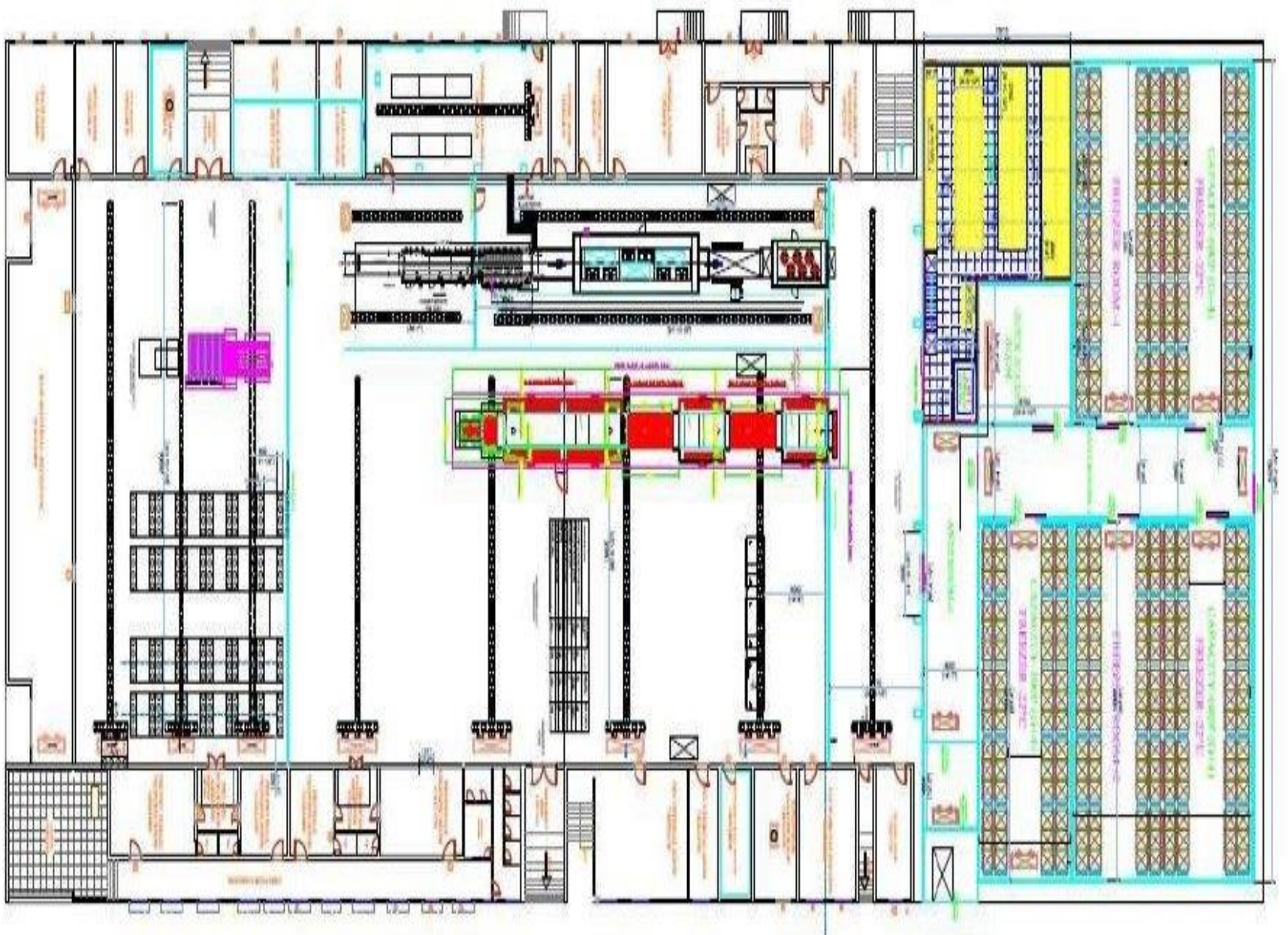
- Uganda Standards (US 201, US 28)
- The Fish (Quality Assurance) Rules
- SOPs for Fish Inspection & Quality Assurance

Post Ban Interventions:

- ❑ UFPEA formation 1992
- ❑ Infrastructure Improvement
- ❑ Donor Funding:
 - CDE
 - UNIDO
 - USAID
- ❑ Capacity Building
 - External Support Programs;
 - Training of Fish Inspectors;
 - Implementing HACCP, GMP's, traceability;
 - Quality Assurance Managers' Association QAMA;
 - Traceability and Product recall procedure;
 - Common approach in addressing quality problems.

Plant design

- Normally the plant design starts with a simple layout drawing. So the sizing of each process location is very important from the energy conservation point of view.
- The area should be well enough to process the required quantity. The additional area should be provided only if there is a requirement for future expansion.
- Not only the length and width but also the height of the processing area should be well enough to have more air space and good air ventilation. However, too high a process area will require more energy per unit area.



- The entire product handling area can be divided majorly into three portions, pre-processing, processing and packing area. It is required to maintain a minimum temperature of 22 to 24°C in all these portions. Another challenge in the industry is that the relative humidity in these areas goes above 95% due to heavy use of water and ice in the process.

- Over and above certain area near process refrigeration equipment, the air temperature goes below dew point temperature which condenses the moisture in the air. So it is necessary to maintain the above said temperature and bring down the RH level between 60 to 70%. A well designed air-conditioning system can directly give three benefits.

Process area Air-conditioning with textile socks arrangement



Fish storage



Harmonization

- Infrastructure up-grading - (1997)
- Quality, Hygiene and Food Safety Standards:
 - External Support Programs (UNIDO);
 - Training of Fish Inspectors;
 - Implementing HACCP, GMP's, traceability;
 - Establishment of QAMA.
- Compliant EU Inspections
- Periodic CA Compliant Inspections

Fish transportation



Temperature maintenance



Good hygiene practices



Quality Control



Addressing Challenges

- Effective upstream control
 - Hygiene;
 - Fishing;
 - Handling & storage;
 - Transport;
 - Food safety training
- Implementing / maintaining quality systems
 - Prerequisite programs (GMPs) – CDE + UNIDO
 - HACCP
 - ISO 9001:2000 (QMS) – USAID (SPEED PROJECT)
 - ISO 22000:2005 (FSMS) – UNIDO
- Market competition – CDE
 - Value addition – UNIDO (COMPETE PROJECT)

Addressing other Challenges

- Resource management
 - Self-monitoring & control program
 - Fish for Future campaign (FFF)
 - Formation of Regional Association

Thankyou for your attention

