

## **I.- AUTHOR'S EXPERIENCES – ENG. ALBERTO MTZ LLAURADO.**

Mechanical Engineer graduated from the University of Los Andes with postgraduate studies and specialization at the Master's level in Rotating Equipment, in Venezuela in the early 80s. I have worked as a technical engineer in reliability of rotating equipment during a period close to 20 years in the oil industry in the process of Oil Refining. During the last 20 years I have worked in the basic and conceptual engineering phases as well as those about detailed engineering for the design, selection, procurement, inspection and testing, supporting also the installation, commissioning and start-up of critical rotating equipment in the oil, gas and power generation industry at the level of some countries such as Venezuela, Spain and Mexico, being in charge regarding the rotating equipment in pre-project phases in the case of several countries such as in Spain, in USA, Mexico and others in Central America, all in the area of machinery and power generation.

Learning and experiences lived as machinery coordinator and as responsible engineer in these 40 years of assistance in the area of rotating equipment (in equipment such as pumps, compressors (centrifugal, reciprocating, dry screw and flooded in oil, diaphragm, positive displacement, axial), turbines (steam and gas), gearboxes (multipliers and speed reducers), power turbogenerators, as well as air and gas fans and blowers, also supporting in auxiliaries like surface condensers, synchronous/ induction electric motors, electrical and hydraulic speed drives, among some others. In these years. In addition, I have been attending the operation and maintenance (routine and major repair after the shutdown plants) in rotating equipment.

In addition, I have had the luck to assist to different Conferences, technical meetings, Symposiums about rotating equipment in these 4 decades, most of the time as listener in USA events made by University or Manufacturer's Companies in USA and also in Latin America.

Besides, I have had the opportunity to attend a number higher than 50 pre-projects (related with conceptual, basic and cost estimating engineering) for the design and construction of this type of equipment of which around 50% became executed and completed projects (that means, including the detailed engineering, equipment purchasing, factory inspections and testing, completing to support at site in the preservation process about the storage, in erection/ installation, pre and commissioning and assisting in the testing and final start-up on site (industrial plants).

Each rotating equipment designed to operate in critical processes is required as a package driver/driven mounted on baseplates or soleplates (due to the complexity of their integration, operation and control adding also the auxiliaries and accessories required as a package), which requires long delivery times, and where the costs of each package can fluctuate (depending on the size and materials required in the equipment), between 500 M\$ (smaller equipment) to 25 MM\$ (critical equipment with high power requirements, to operate in highly risky and severe services), in the oil, natural gas, petrochemicals and also in power generation industries (in single cycle or combined cycle plants and in thermoelectric plants), among others of high standard worldwide (such as natural gas compression stations, in oil & gas offshore production platforms, oil & gas onshore plants, in several public and private industries in the area of petrochemicals, in public and private plants in the cryogenic area, etc.).

Since my beginnings as an advisor/consultant plant engineer applying techniques such as the reliability engineering in rotating equipment until my current situation (4 decades later) considered as a senior specialist & SME, also as responsible / coordinator of engineering, procurement and construction about rotating equipment in all the phases since FEED to detailed engineering, applied in multiple projects related to the oil industry, petrochemical gas and power generation, in which I went scaling positions in the industry reaching the leader and project coordinator in the area of turbomachinery and rotating equipment. This has permitted to me acquire the strong experience and knowledge required, based in my engineering studies, the lesson learned and my dedication, perseverance and attention analyzing / investigating / consulting about issues in this area, it's why I have decided to prepare and write this technical book (as you know, it is an area too broad, complex and very extensive and critical in its scope and knowledge, so in one technical book it would not be possible to attend all the technical aspects that should be discussed or reviewed in order to have a great understanding and learning about it).