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Chemical Engineering for Entrepreneurs

A Chemical Plant Regulatory Permit Pursuit

We have found over the years that permitting is one of the most intense and onerous areas of concern in any new chemical venture. It is common for the permitting to be on the critical path of many projects. Meeting the regulatory requirements on a chemical processing project can often be the largest driver of many aspects of many of the cost elements in the estimate. In general, we view the permitting process as having three major groupings each with a different level of information exchange, review and strategic approach. The ultimate goal is to receive the various "Permit to Operate" documentation from the various Authorities Having Jurisdiction (AHJ).

Site Location Permits – These include the Environmental Impact Reports (EIRs), the various planning and zoning public review procedures, and the evaluations on the impacts to the area. The effort at this level usually requires a well thought out compliance strategy to meet the various detailed regulatory program elements that will be triggered by this site location effort. These generalized state or federal agency permits require involvement with the local political infrastructure.

Agency Permits – The major agency permits usually include:

Employee Protection Agencies (OSHA, and state equivalents) – These agencies usually do not have permits per se, but they have many regulatory requirements that must be put in place by practice and policy for the project. For example: OSHA promulgates the regulations for the Hazardous Communications Programs (Workers Right to Know), Hot Work Permits, Lock Out Tag Out, and Confined Space Entry Programs.

OSHA Process Safety Management (PSM) – Any flammable that will be stored in excess of its PSM planning threshold limit then triggers the full compliance with the federal Process Safety Management program. These are good practices even if not subject to formal compliance, but consideration must be given to the amount of time and effort it will require to insure compliance. Methanol on site in storage in excess of 10000 lbs (1500 gallons) will trigger this regulatory requirement.

Environmental Protection Agencies – Agencies such as the EPA, the state EPA equivalent, and the state Department of Toxic Substance Control (DTSC) typically have a myriad of requirements that are administered through the local building permit process. The establishment of good relationships with these agencies in the early phase of a project is critical to reducing schedule

delays down the line. This is specifically evident as submitted information works through various building departments' compliance processes.

Wastewater Agencies – The primary focus is compliance with the National Pollutant Discharge Elimination System (NPDES). In many cases an industrial facility does not directly pull an NPDES permit, but is subject to the rules and regulations as the wastewater agency into which the industrial site discharges will be subject to the NPDES regulation and permitting structure.

Solid Waste Permits – The interest here is to control the solid waste streams that exit the plant site. These agencies usually were created by the continuing RCRA legislative suite of the federal and state governments. In many cases where there is a high re-purposing of the generated waste this is simply compliance with the characterization of the solid waste that can be transferred to the local landfill. In many cases however, the interest is in the possible hazardous waste that can be generated from the facility. In these instances, evaluation and compliance with the elements of the Resource Conservation and Recovery Act (RCRA) gain importance. The hurdle here is compliance with hazardous waste disposal permitting processes.

Water Districts – In many drought stricken areas or areas where the draw on local water sources is significant, the plant must justify its use of the various proposed water sources.

Air Permitting Authorities – Compliance with the various EPA promulgated air emissions standards are reviewed and regulated by type of hazard and characterization of effect on the atmosphere present. Many local agencies have overlapping jurisdiction depending upon specific location and the various restrictions or special district compliance requirements that may exist. These include details regarding Hazardous Air Pollutants (HAPs), Volatile Organic Compounds (VOCs), ozone depletion chemicals, toxic gases, and poisonous gases. A greenfield plant has a more difficult task in justifying its compliance with the various air programs versus a site that has an established registered emission profile.

Other AHJs - There remain other associated state and federal agencies such as Fish and Wildlife and the USDA that may require information submittals that support permits, compliance, or understanding on a site or project specific basis. These will depend upon the information and identified jurisdictions from the site location permit efforts in the first phase of the permit pursuit.

Building Permits – The third grouping of permits come from the local building departments and all the discipline and detailed local agencies funnel through the building permit issued by the local AHJ. This is a summary permit that includes the local code enforcement officials' requirements, the local fire prevention program requirements, and any other check point design and discipline authority that might exist. Building permits always involves the submittals of stamped and sealed:

1. Detailed civil and structural drawings
2. Detailed fire protection system drawings
3. Detailed site drawings

4. Detailed electrical drawings
5. Architectural programming, life safety, and building mechanical drawings

Local Agency and Cross Agency Interdependencies

Many times the federal and state programs listed above are administered and enforced in some way by the most relevant local permitting agency depending upon the resources and level of jurisdiction of the local agency. In some rural areas, the programs are administered by a state level agency. In some, one agency can be assigned the responsibility to deal with multiple regulatory programs. In some urbanized areas, there is a specific agency that only deals with only one specific aspect of a focused regulatory program.

Local Permit Authority – City or County

1. Local site zoning conditions for the operation of the plant.
2. Local Emergency Planning Commission emergency response (usually set by the local fire prevention authority, fire marshal or fire chief) conditions for the flammables on the site.
3. Special use permit required usually as a condition of zoning in industrial area.

POTW - Wastewater

1. The local publically owned treatment works (POTW) accepts the wastewater discharge profile that will be a result of operations at the equipment installation location. The profile may include low levels of salts, organics, fats, oils and greases. These are usually embodied in BOD (Biological Oxygen Demand) limits or tiered pricing. BOD is usually the regulatory data required for the specific characterization of the waste stream. COD (Chemical Oxygen Demand) testing as the in process indicative measurement for day to day control and countermeasure plans.

NFPA – Usually enforced through local building code enforcement program

1. At least 1 cfm/ft² of required ventilation available, secondary containment, fire wall separation, and emergency response access in the process area
2. Building code required occupancy class for the plant indoor structures.
3. Conditions of the required class 1 division 1 group D and the required class 1 division 2 group D separation and wiring device practices must be met

EPA – Air and Spills

1. 98% of the volatile organic component (VOC) vapors released by the system must be controlled using BACT (Best Available Control Technology). A vent gas scrubbing system, or an EPA approved vapor recovery system is required.
2. Hazardous Air Pollutants, HAPs, have a myriad of BACT requirements.
3. Emissions are limited to 10 tpy to remain under the “major source” classification and thus the more stringent regulatory requirements.
4. Solid particulate matter as characterized by PM₁₀ testing, particle materials of 10 micron or less, is also required to have BACT applied.

OSHA – Workplace Safety

1. The PEL (Personnel Exposure Limits) for chemicals must be managed.

2. The TLV (Threshold Limit Values) trigger certain compliance requirements.
3. The IDLH (immediately Dangerous to Life and Health limits will trigger Hazardous Materials Response and planning requirements. In addition. Certain Planning Trigger Limits will place processes into Federal OSHA Process Safety Management program requirements.
4. If PSM is required. Programs must be identified for the following:
 - a. Operating Procedures
 - b. Training
 - c. Management of Change
 - d. Emergency Planning and Response
 - e. Compliance Audits
 - f. Employee Participation
 - g. Process Safety Information
 - h. Process Hazard Analysis
 - i. HAZOP
 - i. Pre-Start Up Safety review
 - j. Mechanical Integrity
 - k. Hot Work Permit Program
 - l. Contractor Training