

Process Safety Services



PROCESS SAFETY SERVICES:

Oil & Gas, Refineries, and Petrochemical facilities have always stressed Process Safety and have dedicated significant resources to ensure that all operating units are as safe as they can make them. S & B Engineers and Constructors (S & B) is committed to assisting our clients in meeting this objective. S & B provides a variety of Process Safety Services to assist clients with this effort.

The development of Process Safety Management (PSM) Programs and Risk Management Programs (RMP) within the process industries has now been established as a standard good business practice. Regulations, standards, and guidelines are now available. S & B can offer extensive services to our clients in the implementation of the resource documents. These services would include the control, monitoring, and maintenance of these programs. S & B has extensive experience in each of the elements for defined PSM programs and RMP.

"Safety Instrumented Systems" (SIS), "Emergency Shutdown Systems" (ESD), and "Fire and Gas Detection Systems" are being specified more frequently as protection layers from potential process hazards. The International Society of Automation (ISA), and the AIChE's Center for Chemical Process Safety (CCPS) all have guidelines for the selection, design, installation, and maintenance of such safety systems. The efforts of these organizations have been extensive and the results of their work are now well documented and serve as excellent resources for the Oil & Gas, Refining, and Petrochemical industries.

The S & B staff has extensive knowledge and experience implementing the standards and publications as part of numerous projects across the chemical and petroleum sectors.

Services range from consulting on conceptual design through total turn-key projects.

S & B can provide:

- Process Safety Management (PSM) Seminars, Training
- PSM Program Auditing using S & B specialized software
- Process Hazards Analysis (PHA) – S & B has developed specialized software for various PHA methods
- Facility Siting Studies per API-752 / 753
- Human Factors Studies in compliance with PSM requirements
- Engineering Assistance in developing facility policy and procedures for Safety Systems (SIS and Fire & Gas Detection)
- Safety System Seminars, Training
- Risk Assessment (RA) for identification of required Safety Instrumented Functions— S&B has developed specialized software for various RA methods
- Safety Integrity Level (SIL) assignments for identified Safety Instrumented Functions (SIFs)
- SIF Availability and Reliability calculations, validations, and verifications
- Inspection, Testing, and Preventive Maintenance Procedures for Safety Instrumented Systems
- Reliability and Availability studies using Fault-Tree Analysis and Availability Modeling System Software

BRIEF DESCRIPTION OF SOFTWARE CAPABILITIES:

S & B has developed specialized PHA software (copyright pending) that is customized to a client's specific needs. This software is used for the following methodologies

- HAZOP
- What-If
- Check-List

S & B has developed specialized RA software (copyright pending) for determining SIL assignments for SIS functions. This software is customized to a client's specific needs. This software is used for the following methodologies as defined in ANSI/ISA—S84.01 (IEC 61511 Modified)

- LOPA
- Risk Matrix
- Risk Graph

These software systems, as well as other S & B software systems, produce for the client fully functional databases with:

- User-customizable management reports to track recommendations and document study
- Easy transfer of data for additional studies including future revalidations
- Electronic storage of study documentation and associated reference documentation including drawings
- Compatibility with all Microsoft Office™ software products

(Detailed information regarding software can be provided upon request)

CLIENT LIST *(PARTIAL LISTING)*

- Shell
- Delek Refinery
- Refineria Isla
- Westlake Chemical
- Petrologistics
- CFI Industries
- CITGO LCMC
- CITGO Lemont
- Lucite
- Vulcan Chemical
- Degussa
- PAAP
- DSM

(References can be provided upon request)



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degussa.



Refineria Isla Curaçao B.V.

SPECIFIC PUBLISHED REFERENCES INCLUDE:

- 29 CFR 1910.119 OSHA Regulation for Process Safety Management (and associated DOE Handbook—DOE-HDBK-1101-96)
- 40 CFR Part 68 Risk Management Program
- ANSI/ISA 84.01—2004 (IEC 61511 Mod) "Functional Safety: Safety Instrumented Systems for the Process Industry Sector"
- IEC 61508 (1998) "Functional Safety—Related Systems"
- CCPS Text (2007) "Guidelines for Safe and Reliable Instrumented Protective Systems"

Quality Management
System

== ISO 9001 ==



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