Consequence Model Modifications Since March, 2006 Release of 8.0

API RBI User Group Meeting
Houston Marriott Greenspoint

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The Equity Engineering Group, Inc.

Recent changes made to Consequence Modeler, version 8.0

- Corrected the isentropic flash, would crash for very low entropies
- Corrected flash routine to handle negative pressure
- Corrected outage day equation for financial consequences

$$Outage_{affa} = 10^{\left(1.242+0.59\times\log_{10} FC_{affa}\right)}$$

- Corrected mitigation time in new consequence modeler (seconds versus minutes)
- Corrected Metric defaults for the thermal radiation limits, they were off by a factor of 1000 (W/m^2 to $Btu/hr\text{-}ft^2$). As a result, the consequence areas for the NEW consequence model were extremely high when using metric units

Recent changes made to Consequence Modeler, version 8.0

- Corrected flash calculation for a fluid stored as a liquid that flashes to a super-critical fluid, e.g. EO
- Corrected data initializations, especially for consequence modeler - many of the variables were not being wiped clean during the batch calculations and it was compromising the results of other runs.
- Corrected flash routine, only the first fluid component in the composition was being used in the flash calculation; effected inventories
- Corrected cloud source dimensions for instantaneous releases of vapor, source area was way too large (vapor consequences too high)

Recent changes made to Consequence Modeler, version 8.0

- Corrected pool fire dimensions – Radiation distance was being calculated correctly, but was adding total safe distance to outer edge of pool (liquid consequence too high)
- Corrected inventory mass value being sent from APIRBI to PRV module, was sending zero since it was using the wrong variable name
- Reverted back to using the User input value or the default values for RP581 for LV % (Major change from 8.00.005 to 8.1)
  - Eliminated the User estimated vapor and liquid volumes. The user still has the ability to input an estimated component mass and an estimated LV percent.
- Set pressure for calculations to 15 psig if the design and operating pressures are set to zero

Recent changes made to Consequence Modeler, version 8.0

- Cleaned up consequence inventory calculations in consequence model by assuring that a vapor density and liquid density will always be calculated
- Corrected conversion factor for population density
- Modified shutdown days keyword to make it a float instead of an integer, also changed default value for 3 to 0 days– PRV Module
- Corrected the metric unit conversions for back pressure, ambient pressure, overpressure, set pressure, upstream source pressure and deadhead pressure.

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