A major issue facing Operators today is how to cost effectively reduce the health, safety, and environmental (HSE) profile of stimulation treatments. Even though the industry has made giant strides in developing HSE focused materials, until now there has not been a comprehensive method to compare and communicate the overall HSE performance of functionally similar materials. The Chemistry Scoring Index for Production Enhancement addresses this challenge by assessing each chemical used in the stimulation treatment to define its numeric rating from a hazard perspective. This approach can provide a solid basis for choosing more HSE focused chemistry while balancing the choices with chemistry performance and overall well-completion costs. The Chemistry Scoring Index for Production Enhancement is based on United Nations standards for health and safety, and has been evaluated by a recognized HSE risk evaluation firm to assure that the index represents a valid method for comparing the HSE performance of the assessed chemicals.

**Applications**

Halliburton reports and assessments can provide an overall numeric evaluation for the suite of chemicals used in the treatment and a recommendation of how the selection of alternative chemicals could improve the job’s HSE numeric assessment along with costs. This will give the Operator the opportunity to make a well informed decision.

In addition, this approach helps Halliburton focus research and development on products with better HSE scores and challenges the industry to make similar advancements.

**An Industry-Wide Approach**

Although developed by Halliburton, the system will be made freely available to help support the HSE efforts of the entire hydrocarbon production industry.

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**Example of the Chemistry Scoring Index for Production Enhancement ranking for a hypothetical product group. Based on the scoring system, a high scoring chemical can be functionally replaced with a chemical having a much lower HSE impact. The Chemistry Scoring Index provides a means to effectively communicate and implement this change.**
Factors Evaluated

The Chemistry Scoring Index for Production Enhancement is based on a broad range of factors related to HSE hazards associated with a particular product. Regulatory sources that are the basis for assessing the hazard impact of a chemical or fluid system include the United Nations Globally Harmonized System of Classification and Labeling (GHS), USA Clean Air Act, EU-Groundwater Directive, USA Occupational Safety and Health Administration (OSHA) or regulations from other government bodies or nations, to name but a few. The assessments take place within the following categories:

Health hazards which include concerns such as the following:
- Toxicity
- Carcinogen
- Mutagen
- Reproductive toxicity
- Target organ toxicity
- Corrosive/irritant to animal life functions

Physical (safety) hazards which include concerns such as the following:
- Explosive
- Flammable
- Oxidizer
- Corrosive to metal

Environmental hazards which include concerns such as the following:
- Acute/chronic aquatic toxicity
- Hazardous air pollutant
- Priority water pollutant
- Bioaccumulation
- Biodegradation

Based on its chemical composition, each constituent of a product is assigned a rating in each HSE hazard area. The weight percent of the constituent in the product is also factored into the score. The sum of the scores of the HSE hazard areas provides an aggregate score.

The Chemistry Scoring Index for Production Enhancement is not intended to replace state, federal or country regulatory compliance requirements. It is intended to drive behavior to help constantly improve the industry’s HSE footprint.

For more information on Halliburton Chemistry Scoring Index, contact your local Halliburton representative or email stimulation@halliburton.com.