

Responsible Sourcing – Addressing Banned Substances in Oilfield Chemical Products

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Abstract

Continuing the efforts to strive for the next level in Environment, Social and Governance (ESG) and environmental stewardships, the automation of the process to address banned substances as well as addressing other potentially hazardous chemistries in the product portfolio was approached. The criteria for this classification include carcinogens, mutagen, bio accumulative, toxic heavy metals, PCBs, PCTs, biocides with special registration problems, any substances banned by governmental agencies and any substances deemed to be of serious concern.

It is important for companies to actively manage and mitigate the risk banned substances pose to public health and environment by means of:

- Transparency in the supply chain
- Communicating the presence of banned substances
- Exploring alternatives to substitute these materials (when possible)
- Keeping up with changes in regulations
- Collaboration with suppliers to find safer alternatives and improve supply chain sustainability.

Although company measures and safeguards have been in place for years in all these areas, this paper will review the new and more efficient and digitalized approach for the implementation of solutions that closed the gap of the previous approach. These next level solutions include a document signed by all suppliers, that warrant the products provided are free from any of the banned substances listed. In addition to the benefit of lowering the environmental impact of our products, these solution also provides a framework for alignment with global processes and market dynamics of the industry. This paper will also emphasize the importance of interdepartmental interaction to produce relevant and timely responses to corporate initiatives.

Introduction

Responsible sourcing involves ensuring ethical and sustainable practices throughout the supply chain. This

includes identifying and addressing banned substances to minimize environmental impact and promote safety.

Global processes and market dynamics indicate a growing focus on ensuring products to be free of banned substances in their components. Regulations and industry standards are in place to restrict the use of such materials. This paper shows a brief overview of the banned substances definition, the current official lists, and the process created and implemented by the organization to close the gaps in previous procedures to ensure a product portfolio free of banned substances.

The implementation and automation of the banned substances warranty and representation initiative was a team effort that included legal, supply chain, sustaining and regulatory departments. The solution brings additional benefits to sustainability efforts, by avoiding the contact of these substances with people and environment. Additionally, reduces financial exposure to both suppliers, and the company.

This paper presents an overview of the interdisciplinary review of the previously implemented banned substances warranty and representation, including its deployment, and digital implementation.

Situation

The elimination of banned substances from the product portfolio was approached several years ago. This process was conducted on the corporate level and dealt with primarily two initiatives:

- 1) A full disclosure by the manufacturer of all the substances contained within their products.
- 2) Contractual coverage of compliance through our legal and procurement departments.

The full product disclosure (FPD) is a highly confidential document only seen internally by the legal and regulatory personnel involved with the product lines. The purpose for this is twofold. From a legal perspective, a review is required to ensure that the specific product is free from any intellectual property claims or patents. In short, this process assesses the legal element of “Freedom to Operate (FTO).”

The second focus of these confidential FPDs is by the Regulatory department. They review these looking particularly for various hazardous substances, priority pollutant or banned substance to mention a few. The intent is to either keep any of these chemistries out of the product line, or if absolutely needed, then a justification is required, and formal protocol is put in place for handling and disposal to avoid or minimize risk.

The second initiative has been the Commercial Agreement (CA) that the procurement department implements with each individual supplier of chemical products. These CAs are very comprehensive to cover numerous areas including aspects of product chemistry and banned substances. This has been the primary document from both a legal and contractual side warranty several attributes of the product line.

A third initiative is really one of constant review and random inspection from a quality control aspect. Although random, this activity is particularly enforced either when there is reason to believe that there may be a problem, or a problem has occurred. At this time, a surveillance program with action items put in place for a given period.

Fortunately, this third initiative is seldom if ever used because the first two initiatives are typically sufficient to prevent and avoid the introduction of any priority pollutants or banned substances into the product line.

Over the past decade, the entire drilling fluids industry (DFI) has seen an increase in alternative manufacturers and local sourcing of chemical products. Although the first two initiatives are quite effect, there can be issues with each. The FPD is not always forthcoming from some suppliers and there is no guarantee that what appears on the FPD is 100% accurate. Furthermore, the CA can be very lengthy in implementing. In all industries (the DFI is no exception) legal documents can take up to six months to be executed. Some of the new sourcing exercises cannot wait till all documents are in place.

Therefore, it was decided to document and review the situation and attempt a reasonable, but effective solution to maintain the high level of regulatory compliance and low level of risk to both the company and our clients. The solution to this new situation will be discussed after a quick review of the status of the areas of compliance that require addressing.

The Landscape

The task of monitoring and restricting the presence of banned substances and priority pollutants in a product line is not just an internal exercise but also demands awareness of the changing landscape globally. In doing so, one must constantly review the current as well as emerging sites that deal with these substances and are the basis for regulatory protocol. This section will review the current pertinent sites in this arena.

One of the most widely adopted policies is that resulting from the Stockholm Convention on Persistent Organic Pollutants (POP's).^{ref} The Stockholm Convention is a global treaty focusing on protecting human health and the environment from the effects of POPs. POPs adversely affect human health and have been linked to cancer, reproductive disorders, damage to the nervous system and weakening of the immune system. The Convention's policies became active on May 17, 2004.

The site associated with the Stockholm Convention list (<https://www.pops.int/>) contains lists of the substances that are considered POPs. Also, other chemicals are listed with the focus on chemicals that persist in the environment, bioaccumulate in living organisms, and pose risks to human health and the ecosystem.



Some pesticides like DDT and industrial chemicals such as polychlorinated biphenyls (PCB's) are examples of banned substances included under the convention. The convention aims to restrict or eliminate the global production and use of these substances. The initial twelve POPs from the 2004 Stockholm Convention are given in the table below.

Initial 12 POPs in Stockholm Convention
<i>Aldrin</i>
<i>Chlordane</i>
<i>DDT</i>
<i>Dieldrin</i>
<i>Endrin</i>
<i>Heptachlor</i>
<i>Hexachlorobenzene</i>
<i>Mirex</i>
<i>Toxaphene</i>
<i>Polychlorinated biphenyls (PCB)</i>
<i>Polychlorinated dibenzo-p-dioxins (PCDD)</i>
<i>Polychlorinated dibenzofurans (PCDF)</i>

Additional to the Stockholm Convention, the International Labor Organization (ILO) establishes standards and guidelines related to occupational health and safety. The standards may include recommendations or restrictions on the use of certain substances in the workplace to protect workers from hazards. The ILO's Occupational Safety and Health Convention, for example, outlines general principles for maintaining a safe working environment, and individual countries may have regulations that specify prohibited substances in workplaces. The ILO provides guidelines rather than an explicit list of banned substances. However, it emphasizes the importance of controlling exposure to hazardous substances in the workplace. Examples of substances that may be regulated or restricted due to health and safety concerns in various jurisdictions include asbestos, certain heavy metals, specific chemicals, and carcinogens. It's essential to refer to national occupational safety and health regulations for specific details on banned substances in a particular country.


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ANNEX 6.

List of chemicals banned or severely restricted to certain uses owing to their effects on health and the environment in the countries of EU

Although the Stockholm Convention and ILO cover most of the current chemistries that need to be avoided or prohibited in any product line, this list of chemistries and chemistry families continue to increase. For instance, reviews are also performed for priority pollutants and other hazardous substances. In the past few years, fluoro-polymeric chemistries have come under increased scrutiny by regulators and thus new restrictions on per- and polyfluorinated substances (PFAS) have or are being enacted.

Any internal process controlling and monitoring all the chemistries of either global or local concern must be flexible enough to respond to the ever-changing landscape of regulations involving these products. Furthermore, these processes must be robust and responsive enough to avoid any possibility of these materials entering the product line either purposefully or accidentally thus minimizing the risk involved. The resultant processes to be discussed next are both robust and flexible enough to control the introduction of the substances previously reviewed. Additionally, a digital approach for monitoring and deployment that improves communication and faster implementation within the organization and with suppliers will be discussed.

The Current Approach

Although the situation explained above has been quite effective in controlling the introduction of banned substances and other undesirable chemistries into the product line, a few elements have changed over the past decade. These changes have led to improvements in this process. Two of these elements that pushed change in the process for reviewing and documenting issues with the product portfolio were:

- 1) The increase in local sourcing (Conn, et.al., 2024)
- 2) An internal digital process for managing products in the product line.

The element of local sourcing is covered elsewhere, but this exercise brings an overall increase in the number of products to be considered as well as a desire to accelerate the approval process with sacrificing effectiveness and safeguards.

The new digital product management platform (PMP) helps to improve oversight and communication between all departments involved. With this PMP, any updates and product review can be done online and quickly communicated to both the operations and supplier involved. Although there is a variety of departments connected to the PMP, such as technical regulatory, environmental, legal, sustaining, category management and QAQC, the visibility of information related to

each product is controlled by departments. As a note, the FPD discussed above is NOT on this digital site.

Since, the review in 2022 identified changes in regulations and updates in the lists available in the public domain, there have been many steps involved in the new process. The first step was reviewing the substances included in the publicly available list of banned substances. The review included identification of new chemicals added to, and existing ones dropped from the lists (if any). A multi-function team was placed together for the planning and deployment of an updated banned substances warranty and representation initiative that align both, the organization, and the suppliers in the efforts to ensure products delivered are free of components that present the potential to hurt the environment, or the personnel exposed to them. The team included multi-function experts from legal, supply chain, technical, regulatory, and sustaining groups.

The banned substances warranty and representation required the commitment and agreement of both the organization and the suppliers of the product portfolio. In the end, the adoption of the updated banned substances warranty and representation needed to be implemented through the PMP. This version is much simpler than a full-blown product service agreement (PSA) which covers numerous areas related to product such as package and certain IP issues. This new document is quite direct and focus on banned substances and other chemistries covered in the above section. Before any product is introduced into the product line in the PMM, the banned substances warranty (BSW) along with other documents (e.g. FPD) are also reviewed. Of course, this FMM also demands input from all the other departments to ensure that the product will perform effectively in the field and meets other internal standards.

After their review, the supply chain organization would have the task of engaging suppliers in the communication of the updated changes, as well as the deployment and implementation of the changes with the commitment of suppliers. This of course is all monitored by the PMP which is a digital platform designed to cover all aspects of the products, from cradle to grave. The system is the repository of all aspects of the life cycle of a product like approval, pre-shipment, purchase order approval and other aspects.

After the initiative was defined and approved in the Drilling and Completion Fluids portfolio, other business lines of the organization joined the effort, extending to areas like stimulation and cementing. With that in mind, further review of product portfolio for the added business lines was performed and approved for all support functions involved: regulatory, technical, supply chain, sustaining.

Implementation and Deployment

The global regulatory group reviewed the entire portfolio of products and reported that the product composition declared by all suppliers was evaluated of any substances included in the banned substances lists. This list is reviewed bi-annually and is owned by the regulatory compliance team. After the technical, global regulatory and sustaining team reviewed the updated available lists, the legal and contracts teams joined in to

incorporate the changes in the agreements.

Once the upgrades in the banned substances warranty and representation documents were internally approved by all cross functions, supply chain and the global chemical quality organization were responsible for the deployment and implementation within the quality platform and across all the suppliers. With hundreds of suppliers and thousands of products in the portfolio, an individual approach would take tremendous effort and time. This is where the digital product management platform (PMP) was the tool selected for deployment and implementation.

When a product is approved, an internal file for it is created in the PMP. Among other features, the file includes the product purchase specifications, a document electronically signed by the supplier during onboarding. To automate the process of documentation during purchases of products, a supplier portal was created within the quality system. The digital supplier portal is a one-stop shop for suppliers to obtain and provide necessary documentation involved in each purchase order. All documentation is uploaded by the supplier onto its own portal and approved at the company's end.

The addition of the banned substances warranty and representation in the product purchase specifications document includes the link to the public list of banned substances for quick reference to suppliers. The changes are already approved and under production by the developers of the software and will soon be deployed in the system. The implementation stage will involve the electronic signature of the document by all approved suppliers. As stated above, the supply chain and global chemical quality groups are responsible for the deployment implementation with existing product suppliers. Implementation through the digital quality system streamlines the deployment and implementation. It will include the electronic signature at the supplier portal end, which takes a click of a button instead of manual distribution of a physical document, one supplier and product at a time.

Conclusions

The initiative to update the banned substances warranty and representation contributes to the sustainability goals and promotes product stewardship. This initiative contributes to responsible sourcing, by avoiding chemicals that are harmful to people and the environment. Transparent relationship with supply chain is fundamental for alignment between companies and suppliers.

Aligning with suppliers in this initiative prevents exposure to non-compliances and financial risk to both companies and their suppliers.

After regulatory review of the product portfolio, the conclusion that no banned substances are declared by any supplier gives the company confidence that implementation will go without major issues.

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