CSB Staff White Paper

Response to Board questions regarding the effectiveness of safety case and challenges to implementation of safety case in California

Note: CSB Investigations staff members Don Holmstrom, Cheryl MacKenzie, and Amanda Johnson traveled to the United Kingdom (UK) with Board Member Mark Griffon March 4-14, 2014, to gather additional information on how the safety case regulatory regime is implemented and enforced in the UK for both the onshore and offshore oil and gas industry. The information gathered has been produced in the following CSB staff white paper to address questions raised by the Board in its January 15, 2014, motion regarding the effectiveness of the safety case regulatory approach and challenges regarding regulating process safety in petroleum refineries in California.

The CSB staff shall convene a multidisciplinary expert panel (selected by the full Board), similar to the Baker Panel established after the BP Texas City incident, to provide the agency with an assessment of the following topics regarding regulating process safety in refineries in California:

1. To address questions raised in the comments received by the CSB, the panel shall assess the available process safety performance data to evaluate the effectiveness of the safety case regulatory model for refineries.

CSB Investigations Staff Response:

It is necessary first to address the issue of convening a panel. Creating a panel similar to the Baker Panel, which cost roughly $30 million (funds that were fully covered by BP), would require a considerable amount of time, money, and resources that the CSB cannot afford. In addition, there are a number of procedural steps that must be met in order to establish this type of panel, known as a Federal Advisory Committee Act, or FACA, committee -- drafting and approval of a charter (including publication in the Federal Register), selection of Panel Members, financial conflict checks for Panel Members, need to maintain Panel membership balance, public meeting notices, etc. An advisory committee under the FACA can be created only when it is essential to the performance of a duty or responsibility conveyed upon the executive branch by law or Presidential Directive. Finally, Executive Order 12838 issued by President Clinton ordered executive departments and agencies to refrain from creating or sponsoring a new advisory committee subject to FACA "unless the committee is required by statute or the agency head (a) finds that compelling considerations necessitate creation of such a committee, and (b) receives the approval of the Director of the Office of Management and Budget.[1]" The CSB staff advises that creating a panel in this instance is neither compelling nor feasible.

To address Question 1, it is important to note that the Chevron Regulatory Report Draft FAQ 4 addressed the data surrounding the safety case and the occurrence of accidents. The FAQ stated that UK Health and

[1] *Termination and Limitation of Federal Advisory Committees.* Exec. Order No. 12838, 58 Fed. Reg. 28 (February 12, 1993). http://www.archives.gov/federal-register/executive-orders/pdf/12838.pdf (accessed April 3, 2014).

Safety Executive's (HSE's) Hydrocarbon Releases Database System (HCR)[2] in the North Sea, which contains detailed voluntary information of over 4,000 hydrocarbon releases offshore from installations since 1992, shows the total number of hydrocarbon releases offshore to be on the decline. The draft report also stated on pages 57 and 58 that the Petroleum Safety Authority (PSA) in Norway conducts analysis of indicator data as well and produces results on its website. Its analysis showed a decreasing trend in the number of reported hydrocarbon leaks offshore between 2007 and 2010. According to the data the Oil & Gas UK is collecting, the number of hydrocarbon releases has decreased over the last three years (roughly cut in half), but now they are going back up again, and they working to determine why. This highlights the usefulness in the collection and publication of indicator data, and it helps the industry to work towards continuous improvement.

While in the UK, the CSB staff spoke with Peter Davidson of the UK Petroleum Industry Association (UKPIA), a trade association that represents 9 member companies in the downstream oil and gas industry. This includes seven onshore petroleum refineries and roughly 30 terminals in the UK.[3] The CSB staff learned that API 754 was adopted by UKPIA for onshore facilities in the UK, except that it was improved by adding criteria for root causes, and a tier 3 for small fire was created. UKPIA collects indicator data annually from all facilities within the onshore downstream oil and gas sector, analyzes the data, and produces an external report that is published and shared with the companies and with the public on their website. A more detailed analysis is published internally, and it drives UKPIA's agenda. The UKPIA's most recent annual Statistical Review (*2013 Statistical Review*), which is currently available on the UKPIA website,[4] includes a section entitled *Process Safety*, which UKPIA states was produced as one of the key objectives of the UKPIA's commitment to process safety, and in response to improvements being made post-Buncefield regarding the reporting of key process safety performance indicators. This section provides data based on the indicators gathered that are classified as Tier 1, Tier 2, and Tier 3. According to the published data, the number of Tier 1 and Tier 2 events at refineries has decreased between 2010 and 2012 as well as the number of Tier 1 fires or explosions by consequence and the number of Tier 2 events by consequence.[5] They want more sharing and learning from incidents, and want to improve searchability of data on their website.

2. Assess the challenges of making safety case operational and effective with regard to the following topics:

a. What is the role of transparency and community involvement under this regime? Are safety case reports made public?

CSB Investigations Staff Response:

In Australia, a summary of the safety case report is made public. In the UK, the CSB staff has learned that prior to 9/11 a similar summary was made publicly available. However, due to security reasons post-

[2] *See* https://www.hse.gov.uk/hcr3/ (accessed April 3, 2014).
[3] *See* http://www.ukpia.com/home.aspx for more information.
[4] *See* http://www.ukpia.com/files/pdf/statsreview2013.pdf (accessed April 3, 2014).
[5] *Ibid* at 44 – 46.

9/11, the UK ceased to make that summary available under a Secretary of State order. A redacted version is available through the FOIA process in the UK. For example, the Elgin installation safety case was made available through a FOIA request following the 2012 Elgin blowout incident. Seveso III, the EU directive that will be effective as of June 2015, will broaden the availability of information. Seveso III "strengthens a number of areas such as public access to information and standards of inspection…."[6] As the Chevron Regulatory Report Draft notes, the Seveso II Directive is currently implemented in the UK through the Control of Major Accident Hazards (COMAH) Regulations. Seveso III will be implemented through new COMAH Regulations as of June 1, 2015.

According to the HSE, the European Commission updated the Seveso Directive in accordance with the Aarhus Convention on public information, public participation in decision-making, and access to justice on environmental matters. The changes will mean that "the level and quality of information for the public will need to be improved…[and] the information will need to be available electronically and kept up to date."[7] In addition, "[r]equests from the public to see a safety report will be considered on a case-by-case basis as the current Secretary of State Direction will no longer apply."[8] The HSE told the CSB that Seveso III also calls for public reports which show how the performance of industry has improved or worsened.

In addition, as mentioned above, the UKPIA publishes numerous documents, including statistical reviews containing data analysis on its website to aid in transparency and community awareness. The HSE told the CSB staff that there is also transparency in the way the HSE does its work. For example, the HSE enforcement decision processes for the safety case are available to the public online. The decision process for accepting or rejecting a safety case is also public. Oil & Gas UK stated to the CSB staff that they publish a list of incidents on their website that includes the name of the operator, the type of release, and the quantity. They also have data on safety critical backlog and other metrics on their website.

The level of transparency the team saw in the UK is much greater than in the US – the regulator's activities, standards, data, and other information is made available online to the public and is part of how these groups are continuously working in the UK to improve process safety. The potential recommendation to California in the Chevron Regulatory Report Draft addresses the importance of transparency and community involvement, as it includes a provision to require "reporting of information to the public to the greatest extent feasible such as a summary of the safety report, the process hazard analysis, a list of safeguards implemented and standards utilized to reduce risk, and process safety indicators that demonstrate the effectiveness of the safeguards and management systems…."

[6] *See* http://www.hse.gov.uk/seveso/introduction.htm (accessed April 3, 2014).
[7] *See* http://www.hse.gov.uk/seveso/public.htm (accessed April 3, 2014).
[8] *Ibid.*

b. How are workers empowered as part of the tripartite model? Have there been retaliatory actions taken against workers for their involvement, and what protective measures are in place?

CSB Investigations Staff Response:

The CSB staff spent one of its days in the UK at a launch of a workforce initiative of great importance called the Workforce Engagement Support Team, or WEST. WEST is a workforce-led organization with tripartite membership from industry, the workforce, unions, and the regulator with the goal of creating a single consistent workforce agenda. This event brought together hundreds of individuals from the offshore oil and gas industry, including safety representatives, unions, and the HSE. The CSB staff set up a booth at the event and held 30-minute sessions where we engaged in an open dialogue with attendees discussing workforce engagement and involvement issues offshore. The CSB staff heard a lot from workers and safety representatives about the various levels of workforce involvement. One individual stated that best practice was introduced by the safety case, and this does not exist with compliance-based regulation. Another person stated that if a safety case is deficient, that means there was likely a lack of workforce involvement. We heard that there is safety representative involvement in ALARP, bowtie development and review, hazard analysis, and other safety activities. We also heard that the level of involvement may depend on the culture of the installation. It was really a defining moment to experience this kind of open dialogue between different groups that have come together to work to improve safety offshore. The CSB staff has never seen this kind of communication or collaboration in the US.

In addition, two years ago Step Change launched the workforce engagement tool – a survey meant to measure workforce involvement and organizational culture of each offshore manned facility. Over 10,000 workers have taken the survey and the results are currently being analyzed. Workers at the WEST launch told the CSB that the surveys are helpful and allow each installation to drive forward and improve.

The potential recommendation in the Chevron Regulatory Report Draft reflects the importance of workforce involvement, as it proposes that California "[u]se[] a tripartite model where the regulator, the company, and the workers and their representatives play an equal and essential role in the direction of preventing major accidents." The CSB has also noted that while workers do not have stop work authority in the UK, they do in Norway. Unions in the UK, such as Jake Molloy with RMT, have argued for stop work authority for UK offshore workers. The CSB staff included language in its potential safety case recommendation to California reflecting the importance of this type of authority. The potential recommendation currently states: "The representatives should also have the authority to stop work that is perceived to be unsafe or that presents a serious hazard until the regulator intervenes to address the safety concern."

c. Are safety committees mandatory or optional in non-union workplaces? How are safety committee members selected, and under what authority?

CSB Investigations Staff Response:

The Chevron Regulatory Report Draft discusses on page 54 the fact that the law in the UK provides for consultation with employees or their safety representatives on health and safety matters at both unionized and non-unionized onshore facilities under the Safety Representatives and Safety Committees Regulations 1977 and the Health and Safety (Consultation with Employees) Regulations 1996. It is important to note, however, that all onshore oil and gas facilities in the UK are unionized. These regulations go further than the OSHA PSM standard in that they provide for the election of safety representatives by workers to serve many health and safety-related functions, including investigating complaints and accidents, and carrying out inspections. The regulations also require employers to establish a safety committee when one is requested by at least two health and safety representatives.

According to the HSE offshore division, it is up to the companies to decide how much they involve workers. Safety representatives have the legal right to initiate their own investigations, conduct inspections, resolve hazard complaints, and participate in risk management reviews and the development of safety case reports. The HSE also stated that an issue has been the competency and sufficiency of training of the safety representatives, and as such, the HSE is initiating more training to improve the involvement of safety representatives.

The Chevron Regulatory Report Draft proposes that California develop a regulatory model and accompanying guidance based on these UK regulations, and that the elected representatives should have a legally recognized role that goes beyond consultation in activities such as the development of the safety report, process hazard analysis, management of change, incident investigation, audits and identification and effective control of hazards. Workforce participation practices should be documented by the company and submitted to the regulator.

d. Is there a public data base of incident and near miss reporting? How are process safety performance indicators developed and used? Are these made public?

CSB Investigations Staff Response:

As discussed above, UKPIA collects Tier 1, Tier 2, and Tier 3 indicator data annually from all facilities within the onshore downstream oil and gas sector, analyzes the data, and produces an external report that is published online and shared with the companies and with the public on their website. A more detailed analysis is published internally, and it drives UKPIA's agenda. According to the *COMAH Process safety performance indicators Operational Delivery Guide,* by the end of 2015 all COMAH sites will measure

their performance using "key leading and lagging performance indicators."[9] The expectation for COMAH sites as noted in this document is as follows:

– Have a programme for PSPIs [process safety performance indicators] – as one of the main ways the adequacy and performance of PS risk is managed,
– PSPI's are linked to effective Process Safety Leadership and should be used to inform high level decision making,
– KPIs should be set according to risk profile of the activities undertaken
– Adopt both Outcome (lagging) and Activity (leading) indicators,
– Use the findings from the KPI programme to drive improvements on site, and
– share sector performance data with the CA as part of a dialogue about performance.[10]

Inspectors are expected to monitor progress made towards the development of these indicators every 12 months and ensure it is "based on sound decisions/information."[11]

Offshore, the HSE collects major accident data, hydrocarbon releases, and dangerous occurrence data. The offshore industry also collects a number of indicators and voluntarily provides them to Oil & Gas UK for annual industry data analysis. This data includes hydrocarbon releases, safety critical maintenance backlog, the number of failure identified by third party verification, the number of operational risk assessments in place, and employee involvement (scores of each facility based on safety culture survey). During the regulator's inspection process, also known as the intervention, the HSE can ask for information on the company's indicator's system and for all of this industry-wide key performance indicators (KPI) data. The Oil & Gas UK is looking at what else could be usefully collected, and they are working on sharing more information. They want more sharing and learning from incidents, and want to improve searchability of data on their website. According to the data the Oil & Gas UK is collecting, the number of hydrocarbon releases has decreased over the last three years (roughly cut in half), but now they are going back up again, and they working to determine why. This highlights the usefulness in the collection and publication of indicator data, and it helps the industry to work towards continuous improvement.

e. How are standards for minimum levels of risk set (ALARP presumably goes beyond minimum levels)?

CSB Investigations Staff Response:

For both the onshore and offshore safety case regime, a majority of the time ALARP is determined by existing best practices or standards. The regulator does have the ability to require a company to go above and beyond best practice to reduce risk. According to the HSE onshore division, ALARP is an active process and dialogue between inspectors and the duty holder. It is not simply a paper exercise; there is

[9] *COMAH Competent Authority Workstream 2e, Process safety performance indicators (Operational Delivery Guide);* p 3. http://www.hse.gov.uk/comah/guidance/process-safety-performance-indicators.pdf (accessed April 14, 2014).
[10] *Ibid.*
[11] *Ibid.*

rigorous back and forth. The initial calculation of ALARP by the duty holder onshore is quantitative. Then the question becomes, "can I/you do more to reduce risk?" There is a risk carrot posted on the HSE website that illustrates the goal of moving risk down toward the bottom of the carrot. The aim is to get to the broadly acceptable risk level, which usually involves both quantitative and qualitative analysis tools. According to Peter Davidson of UKPIA, there has been increased focus onshore on ALARP since the 2005 Buncefield incident. If a new standard does come into existence, an existing facility must do a quantitative and qualitative gap analysis to demonstrate whether they can effectively mitigate risk without following the new standard.

A lead inspector with HSE onshore told the CSB staff that he has an initial safety report rejection rate of almost 100 percent, and that there is an ongoing dialogue/negotiation that occurs between the regulator and the duty holder as to reduction of risk. This ongoing dialogue of risk assessment and reduction was said to be more valuable than the safety report itself. As such, the credibility, persuasiveness, and personal communication are key attributes of HSE inspectors.

f. What are the enforcement methods used by regulators under the safety case?

CSB Investigations Staff Response:

Post-Buncefield, the HSE onshore stated to the CSB that they greatly emphasize interventions, or inspections, to ensure that companies are fulfilling their safety reports. Roughly 70 percent of an HSE onshore inspector's time is spent inspecting. They greatly emphasized to the CSB staff importance of the inspections and dialogue between the inspector and the duty holder rather than the safety report document itself. They stated that the rest of an inspector's time is spent on safety report assessment, investigation, and enforcement.
To begin the safety report review process, the HSE initially assesses ALARP and the risks/hazards. They screen to see what they have and where, onsite and offsite, worst case scenarios, ALARP demonstration/analysis. Next the inspector(s) look at the measures and controls in place. This is done by discipline – process safety, human factors, etc. Inspectors use the Safety Report Assessment Manual (SRAM) as a guide during an assessment. This guide is also provided to duty holders. Next, the inspectors come back together after they have assessed the report for a conclusions meeting. They discuss whether there are any "serious deficiencies" in the report. A mechanical integrity issue is often a serious deficiency. If there are serious issues, the HSE will issue a formal improvement notice for the company to address any deficiencies. Issuing such a notice requires "clear evidence."

If the HSE issues a COMAH prohibition notice, this stops a process in its tracks based on a serious deficiency. This results in the shutdown of the site. HSE issues three or four of these each year. Few regulators in the US have this direct power (Cal/OSHA does).

The initial safety report assessment helps form the HSE's intervention plan for the facility. The HSE inspector uses this plan during the verification and inspection of the facility on site. Here, the HSE inspector can tell whether the company is actually doing what they say they are in their safety report. As discussed above, roughly 70 percent of an HSE inspector's time is spent on inspections. Most inspections

are planned, because inspectors review complex issues that require site specialists to be present during the inspections.

Each site visit has a detailed agenda and is provided to the facility roughly four weeks in advance of the visit. The HSE conducts 10 to 15 inspections per refinery per year; this results in an inspection report. The Goal is to inspect every COMAH facility once every three years; high hazard profile sites once per year, and refineries are visited monthly due to the regulator's assessment of higher risk at refineries.

Offshore, the HSE can issue a prohibition notice if there is an immediate risk and "potential" for injury. During an appeal, this notice remains in effect. The HSE can also issue improvement notices that give the duty holder a period of time to make specific improvements. If they fail to make those improvements, the operation is stopped. Notices are placed on a public database once any appeal of a notice is resolved.

g. What are the key transition issues that were addressed with facilities in operation at the time the safety case was adopted?

CSB Investigations Staff Response:

The Chevron Regulatory Report Draft discusses key transition issues in FAQ 6 on pages 114-115. Major issues include lack of sufficient funding, lack of stakeholder commitment to the process, under resourcing of the safety case process, the regulator is poorly trained or technically challenged, and insufficient workforce involvement in the process.

It is also important to note that the CSB staff learned a lot of positives about the onshore COMAH and safety report process in the UK. For example, the staff learned that as a result of the Buncefield incident there has been an increased focus on inspections, there was a Process Safety Leadership Group formed that works to improve safety and share lessons learned, and there is more focus on ALARP. In addition, the staff learned from industry representatives that HSE onshore has a better reputation than HSE offshore in terms of inspections and challenging from the inspectors. HSE onshore is said to have a more robust, structured, inspection program, whereas HSE offshore needs to improve in that area. Overall, the CSB staff came away with a very positive view of the HSE onshore regime and COMAH. The amount of work that is put into continuous improvement, transparency, and workforce involvement is incomparable to what currently exists in the US.