

**OCCUPATIONAL SAFETY
AND HEALTH STANDARDS BOARD**

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Minutes from the Advisory Committee Meeting For
Title 8, Petroleum Safety Orders-Drilling, and Production, Sections 6554, 6625,
6651 and 6684, Diesel Engine Air Intake Shut-off Valves and Spark Arresters
Cal/OSHA Training Room
2211 Park Towne Circle, Sacramento, CA
February 8, 2011

The meeting was called to order by the Chairman, Hans Boersma, Senior Engineer-Standards, Occupational Safety and Health Standards Board (Board) at approximately 10:00 a.m., Ms. Leslie Matsuoka, Staff Services Analyst, Mr. David Beales, Legal Counsel and Mr. Marty Tamayo, Associate Safety Engineer were present to provide assistance. Mr. Len Welsh, Mr. Joel Foss and Mr. Clyde Trombetta represented the Division of Occupational Safety and Health (Division).

The Chairman explained the Board's policy and procedures regarding the goals, objectives and use of advisory committees, and reviewed the Administrative Procedure Act requirements that must be considered during the rulemaking process. The Chairman stated that the committee would consider the necessity, clarity and reasonableness of the proposed requirement for air-intake shut-off valves (AISV) on diesel engines and cyclone type spark arresters on all internal combustion engines operated at gas and oil well sites subject to the Petroleum Safety Orders in subchapter 14. Additionally, the committee would review standards that currently regulate these diesel engines to determine whether the proposal would constitute a duplicative requirement.

In reviewing the background of the proposed standards, the Chairman explained that the proposal was the result of Petition 516 filed on July 8, 2010 by Mr. Jogen Bhalla and granted by the Board on October 21, 2010 to the extent that a representative advisory committee be convened to consider the recommendations to amend Sections, 6554, 6625 and 6651. The Chairman stated that Petition 516's recommendation to apply similar standards for diesel engine shut-off devices at refinery operations subject to Subchapter 15 of the Petroleum Safety Orders was denied by the Board, because an earlier advisory committee convened to consider such amendments to Subchapter 15 was unable to reach a consensus as to the necessity for such a standard. The Chairman provided time for Mr. Jogen Bhalla to present his recommendations and rationale for the petition.

Mr. Bhalla, Vice President, AMOT, Inc., stated that he had filed the petition to address the safety issues of runaway diesel engines at oil and gas drilling and production sites in California and to prevent such accidents as occurred at the BP Deepwater Horizon on April 20, 2010, where the source of the explosion and subsequent fire was the result of runaway diesel engines associated with generators. Mr. Bhalla indicated that runaway diesel engines are not merely a source of ignition but also a source of detonation where the release of a much larger amount of energy can cause much more damage. Mr. Bhalla stated that this requires a higher magnitude of safety and justifies a proactive approach of regulating this hazard. Mr. Bhalla justified including vehicular diesel engines in the proposal, because many of the accidents he reviewed involved vehicular diesel engines. Mr. Bhalla stated that many in the industry have experienced runaway diesel

engines and that some have used pieces of 2X4-inch lumber, clothing, or other objects to block the engines air-intake in order to stop runaway engines.

Mr. Bhalla showed an AISV developed by Esso-Mobil that is fully automatic and activated via intake air velocity. Mr. Bhalla indicated that the Esso-Mobil type devices would be used on smaller diesel engines whereas the larger engines would use electrically actuated devices. The electrically actuated devices are usually equipped with manual override switches to enable a manual shut-down of the engine. Additionally, Mr. Bhalla stated that manual controls are available as wireless and remotely wired controls to prevent people from having to run to the runaway diesel engine to shut it off, since there is no time during a runaway condition to do so.

Mr. Bhalla stated that modern engines are installed in very tight spaces and that the industry has made installation kits available for all diesel engines to ensure that the shut-off devices can be installed in the limited space available. Mr. Bhalla stated that in addition to the cost of the device, the installation kits range in price from about \$50 to \$800.

Mr. Bhalla stated that governments and companies outside the United States have regulations and policies in place that require the installation of automatic AISVs. Mr. Bhalla cited Canada¹ as an

¹For reference, please note that Canadian standards for land based oil and gas well operations include the following requirements:

Manitoba, CN, requires that diesel engines within 10 m (33 ft) of a well that is open to the atmosphere or any other source of ignitable vapor must be equipped with an air intake shut-off valves, w/ a remote control easily accessible from the operator's station; or a system for injecting an inert gas into the engine's cylinders w/ a remote control easily accessible from the operator's station; or a duct that provides air for the engine from a distance of at least 10 m (33 ft) from the well or source of ignitable vapor; or must be equipped with any other effective and approved device.

Alberta, CN, requires diesel engines within 25 m (80 ft) be equipped with either an "adequate" air intake shut-off valve, w/ a remote control readily accessible from the driller's station; or a system for injecting an inert gas into the engine's cylinders, w/ a remote control readily accessible from the driller's station; or a suitable duct so that air for the engine is obtained at least 25 m (80 ft) from the well; or must be equipped with any other effective and approved device.

Prince Edward Island, CN, requires that diesel engines within 75 ft of a well be equipped with either an approved air intake shut-off valve w/ a readily accessible remote control; or a system for inserting an inert gas into the engines cylinders, w/ a readily accessible remote control; or a suitable duct so that air for the engine is obtained at least 75 feet from the well; or any other effective and approved device.

British Columbia, CN. (Late 2010 British Columbia opted out of a similar prescriptive standard in favor of the following performances standard) If regular monitoring and hot-work permits are not in use to control ignition sources, internal combustion engines must be shut down within locations defined as Class 1 Division 2 or higher classification hazardous locations. If their operation is integral to the work process, diesel engines required to operate within a zone, defined as a Class 1 Division 2 or higher classification must have a positive air shutoff or other effective method for engine shut down. Mobile equipment powered by a diesel engine and used for maintenance or repair work on pressurized gathering, distribution and transmission equipment must have a positive air shutoff or other effective method of engine shut down.

Yukon, CN. Where a regular monitoring and a hot-work permit system are not in use to control ignition sources, internal combustion engines must be shut down within the Class 1 Division 2 or higher hazardous location, or if integral to the work process, diesel engines required to operate within a Class 1 Division 2 or higher hazardous location must have a positive air shut-off or other effective method for engine shut down. Mobile equipment powered by a diesel engine and used for maintenance or repair work on pressurized gathering, distribution and transmission equipment must have a positive air shutoff or other effective method of engine shut down. During well servicing (a) the air intake and exhaust of the pump motor shall be located 6 m (20 ft.) from the rig tank while the pump is circulating hydrocarbons, and (b) the tank truck shall be located on the far side of the rig tank from the wellbore and at a distance 6 m (20 ft.) from the rig tank during loading and unloading.

example, where the passages of similar oil and gas drilling and production safety regulations have eliminated accidents related to runaway accidents.

Mr. Welsh, noted that the Esso-Mobile AISV appears to be a very simple solution to diesel runaways and questioned how difficult it is to retrofit diesel engines with these types of devices and what the maintenance requirements are for these devices.

In response to the questions regarding required maintenance and testing, Mr. Bhalla stated that, because the valves are relatively simple in design, they do not require much maintenance but because of the work environment they should be checked and tested at least monthly to insure the valve closes properly and that it is free of mud, dust, etc. With regard to durability, Mr. Bhalla indicated that the electrically actuated devices meet a very high standard of quality but that the AISVs can breakdown.

Mr. Russ Haddadin, AMOT, Inc., stated that the Esso-Mobile AISV is not the only solution, for example there are automatic wired AISVs and remotely controlled AISV that are wired with toggle switches.

Mr. Bhalla found inconsistent compliance with current AISV requirements in California. Mr. Bhalla stated that he could not find diesel engine runaway accident reports for oil and gas drilling and production operations in California, but that in talking with different companies in California, he found that many experienced runaways, near misses and actual explosions related to runaways. With regard to the proposal to require cyclone type spark arresters for all internal combustion engines within 100 feet of the wellbore, Mr. Bhalla stated that his recommendation is based on the oil and gas industries own consensus standard, the API 54 Standard². Mr. Bhalla indicated that except for the forestry industry, there are no standards for cyclone type spark arresters in the United States. Mr. Bhalla stated that as the result of extensive studies and testing by the European countries, the cyclone type design was found to be most effective. Mr. Bhalla indicated that 80% of the spark arresters used today are of the type that permits sparks to escape from the exhaust system.

The Chairman reviewed Board staff's proposal and explained that the petitioner's recommendation to require AISVs on diesel engines are reflected in the proposed amendments to sections 6554, 6625, and 6651. The petitioner's recommendation to add a requirement for a cyclone type spark arrester is reflected in the proposed spark arrester standard in Section 6684 provided to the committee and in section 6651(d). The Chairman stated that the proposed standards are a starting point and indicated that the committee would review the proposal, provide comments and recommendations to amend the proposed language in order to develop a consensus standard that would ensure effective and reasonable safety requirements for the operation of diesel engines at well site operations subject to Subchapter 14.

² For reference, the API 54, 2007, RECOMMENDED PRACTICE FOR OCCUPATIONAL SAFETY FOR OIL AND GAS WELL DRILLING AND SERVICING OPERATIONS, Section 9.15.1, recommends that emergency shut-down devices that will close off the combustion air should be installed on all diesel engines associated with drilling and well servicing rigs. Section 9.15.3 recommends that spark arresters or equivalent equipment shall be provided on all internal combustion engine exhausts associated with drilling and well servicing rigs located within 100 feet of the wellbore.

To review oil and gas well related accidents, the Chairman provided each committee member with a printout of the three reported accidents that occurred in California and the six reported accidents that occurred in other States during the time period from 1990 through the beginning of 2011. The reported accident data showed the following:

- 1) Accidents from January 1990 through January 2011.
- 2) For sites subject to Gas and Oil Well Drilling and Production standards, the data shows a total of three accidents in California and four accidents in other states. (Two additional accidents presented during the meeting involved vacuum trucks at facilities not regulated under the Gas and Oil Well Drilling and Production standards).
- 3) All accidents at sites subject to Gas and Oil Well Drilling and Production standards occurred at open wellbores.
- 4) All well site accidents occurred while the well was undergoing drilling, testing, maintenance, work-over or abandonment operations when blowout preventers, valves or other well head containment systems had been removed or opened.
- 5) All accidents appear to have occurred in the immediate vicinity of the open wellbore.
- 6) No data or verifiable information was provided to indicate that runaway conditions have occurred beyond the 50 feet radius from the open wellbore.
- 7) Accident data shows that on several occasions employees were injured or killed while running towards the runaway diesel engine to actuate the AISV.

The Chairman requested committee comments regarding the accident data presented.

Mr. Trombetta, stated that the reported accidents presented here only show the serious accidents that required reporting. Data about diesel runaways that did not cause reportable injuries are not posted on the Cal/OSHA and Federal OSHA websites. Mr. Trombetta stated that there is evidence of additional accidents involving runaway diesel engines and that California should be proactive in preventing accidents like the Texas City refinery accident even when we have a few reported runaway related accidents.

Mr. Guy Bjerke, Western States Petroleum Association, stated that when comparing accident data from California and other states, it is important to look at all the regulations in effect in the different states as well as what other mitigating factors California sites have that those in the other states do not have. Mr. Bjerke stated that we should be proactive, but that we do so by considering all the factors when we develop the proactive standard.

Mr. David Simmons, United Steelworkers, Local 675, stated words to the effect that California should not stay with what the industry has been doing, which according to the above accident data, is not effective in preventing the accidents, instead, we should require an effective engineering control (i.e. the automatic air-intake-shut-off device) that will prevent these type of accidents.

Mr. Bhalla, responding to a question whether the requirement for automatic AISVs has been effective in reducing runaway related accidents, stated that after Canada passed the latest oil and gas drilling and production requirements only a minor accident has occurred.

Following the review and discussion of the accident data, the Chairman opened the floor to discuss the proposal.

Labor representatives strongly supported the proposal to require all diesel engines within 100 feet from the well to be equipped with an automatically actuated AISV. Labor felt that the American Petroleum Institute (API) came up with 100 feet rule after considering modeling studies and the incidents. Because the proposal is consistent with the API standard, labor considers the proposal reasonable and felt that it would be proactive in preventing accidents and avoiding the death or injury of workers. Labor felt that the drilling and production industry should not wait until after accidents and fatalities have occurred to promulgate these standards. Labor stated that the proposal met the necessity standard because there is always a possibility of a release of flammable gas or vapor at the well sites. Additionally, Mr. Steve Sullivan, International Representative, United Steelworkers, Dist 12, expressed his concerns about strictly relying on manually actuated AISVs and having to take the time to gain access to the diesel engine compartment in order to actuate a manual AISV on a diesel engine. Mr. Sullivan felt that there is often not enough time to open the engine compartment and then follow a prescribed procedure to actuate the shut-off device.

Mr. Welsh noted that the real question is whether there is a problem that needs fixing, and whether the proposal before us is a reasonable fix. Mr. Welsh stated that, despite the existence of safety orders and applicable environmental regulations, this accident data suggests that there is a problem, and when the runaway diesel engine accident does occur, the consequences are often catastrophic. Mr. Welsh stated that, because it is often difficult to stop the runaway cycle of the diesel engine when flammable gasses get into the air, the proposed automatic AISV appears to be the correct solution.

Management representatives responded that the proposal was too restrictive and that it would remove the necessary flexibility to effectively operate the different well sites. Management noted that some production sites diesel engines could need the proposed automatic AISVs; however, at other sites (where, for example, heavy crude oil is produced), other means of protection may be more appropriate. Management felt that the choice of safety procedures and engineering controls is best determined through risk-based assessments and should be left up the persons managing the safety at the specific site. Therefore management felt the proposal was unreasonable and that if the committee was to go forward with a proposal it should narrow the scope and recognize alternative measures and provide options for managing the overspeed hazard.

The Chairman asked management representatives for alternative language that would provide the necessary flexibility and at the same time maintain diesel engine safety.

Mr. Foss recommended the committee consider using the scope for the spark arrester standard in Section 6684(a) as a model for the AISV requirements.

Management felt that this rulemaking requires careful and thoughtful consideration because the far reaching implications of these requirements would probably require more time for consideration than what has been allotted for at this committee meeting.

Mr. Foss asked for committee clarification regarding the relevant differences between heavy and light crude oil, and whether there is a level of predictability of gas and vapor emissions based on the type of crude oil.

Mr. Gough, Safety Team Leader, Occidental of Elk Hills, Inc., stated that the weight of crude oil is measured in terms of API gravity³. The different oil fields will generally produce different weight crude, and even different wells may produce crude oils of differing API gravity. However, Mr. Gough stated that wells producing heavy crude oil produce much less flammable gas and vapor whereas wells producing light oils will generally produce considerable amounts of flammable gas that must be separated from the crude oil at the site⁴.

Mr. Sullivan stated that no one can predict if and when gas will come up through the well.

Mr. Rick Latham, Sub District Director, United Steelworkers, District 12, stated that relying on companies to police themselves leads to a lack of uniformity in well site safety. Additionally, Mr. Latham stated that the proposal is not developed to address hazards during normal operations; it is intended to save life and property when things go wrong. Mr. Latham noted that the API recommended 100 feet rule should apply to California work sites.

Mr. Simmons stated that even when a well produces heavy crude oil flammable gas is liberated because of the heating process necessary to bring the oil to the surface. Mr. Simmons stated that, because of the possibility of human error and possible containment failure, the proposed automatic AISVs seem very appropriate.

Mr. Haddadin stated that because mobile diesel powered equipment and trucks are routinely moved around the well site and from site to site the exposure to runaway hazards is significant and therefore all mobile diesel powered equipment and trucks should be equipped with automatic AISVs.

Mr. Ed Crane, Secretary-Treasurer, United Steelworkers, Local 12-6, stated that, even though some members find the proposal too prescriptive, he encouraged going forward with the standard but make allowances in the scope for the different well site conditions.

Mr. Bjerke stated that it is important to consider all existing rules and regulations which must be complied with to control emissions of flammable vapors at extremely low levels. Mr. Bjerke stated that in addition to these safety orders, numerous environmental standards and the California emergency planning and community right-to-know law requirements also regulate the petroleum drilling and production industry regarding fugitive emissions. Therefore it is important when considering the necessity for this proposal, the committee should not only consider all regulations these well sites are subject to, but also the fact that, because of these regulations, so few diesel

³ For reference, the American Petroleum Institute gravity, or API gravity, is an inverse measure of the relative density of a petroleum liquid and the density of water, but is used to compare the relative densities of petroleum liquids. If its API gravity is greater than 10, it is lighter and floats on water; if less than 10, it is heavier and sinks. Crude oil is classified as light, medium or heavy, according to its measured API gravity where Light crude oil has an API gravity higher than 31.1°API, Medium oil has an API gravity between 22.3°API and 31.1°API, Heavy oil has an API gravity below 22.3°API and Extra heavy oil has an API gravity below 10.0°API.

⁴ For reference, natural gas is almost always a byproduct of producing oil, since the small, light gas carbon chains come out of solution in the form of natural gas as they undergo pressure reduction from the reservoir to the surface.

runaway incidents occur in this industry. Mr. Bjerke stated that WSPA's members have expressed concern the proposal would increase the regulated area (e.g. the area within 100 feet from the wellbore), and the type of equipment that would be regulated under the new proposal. Mr. Bjerke noted that the California oil and gas well work environment is different from the rest of the country because of the differences in the safety regulations enforced by the Division. Mr. Bjerke noted that the 100 feet API rule referred to by Mr. Bhalla only applies to spark arresters not to AISVs. With regard to the proposed spark arrester standard, Mr. Bjerke stated that WSPA members do not feel it is necessary to amend the spark arrester requirements and find the proposal unnecessarily prescriptive. Mr. Bjerke felt that the current spark arrester standard would permit the use of the proposed spark arrester as well as other effective devices and added that the proposed spark arrester standard would in fact preclude new technology and would force the Standards Board to update the standard every time new and better spark arrester technology is introduced to the industry.

Labor felt that the other codes such as fire codes, air quality standards, and other environmental codes do not address the issues before the committee today, and will not address the hazards of diesel engine runaway associated with a vapor release.

Mr. Bhalla stated that his recommendation for a 100 feet distance from the wellbore is consistent with API 54 language and is based on the speed at which gasses dissipate. Mr. Bhalla provided information on the safety zone used in Canada and showed diagrams of the different well site layout with respect to the required safety zone used in Canada.

Mr. Sam Mannan, Texas A&M University, stated that, generally speaking, a risk-based and performance-based approach works best, however in the case of diesel runaways, he opines that the more prescriptive requirement for AISV should be used to prevent these types of catastrophic accidents. Mr. Mannan felt that the only question to be addressed is whether the proposal will use the 50 feet or 100 feet rule. Mr. Mannan recommended the 100 feet safety zone around the wellbore and stated that the research and modeling supports the determination to use the 100 feet rule. Additionally, Mr. Mannan stated that the ultimate cost involved with changing from the 50 feet to the 100 feet rule is insignificant because much of the equipment that would become subject to the 100 feet rule was already mandated to have AISVs under the existing standards.

Mr. Trombetta noted that the 100 feet modeling was done for spark arresters and not for diesel engine AISV and that the 50 feet zone may be appropriate for the diesel engine shut-off valves.

Labor agreed with Mr. Scott Robinson, Coastal Ignition & Controls Inc., who stated that even though the modeling has been for spark arresters, the same principles should hold true for AISVs and therefore strongly supports the 100 feet safety zone as proposed. Labor stated that it is not reasonable to reject the 100 feet on the basis that the industry has used the 50 feet rule for years.

When asked, "what is the API 54 safety zone requirement around the oil or gas well for diesel engines AISV," Mr. Bhalla stated that the API 54⁵ requires a 25 meter (80 feet) radius.

⁵ For reference, API 54, 2007, RECOMMENDED PRACTICE FOR OCCUPATIONAL SAFETY FOR OIL AND GAS WELL DRILLING AND SERVICING OPERATIONS, Section 9.15.1, recommends that emergency shut-down

Mr. Welsh stated that if a performance standard requires an employer to have procedures in place to prevent a specific type of accident and the procedure the employer implemented did not prevent the accident and someone sustains a reported injury, the employer could be accused of seriously and willfully violating the requirement. Mr. Welsh asked those opposing the proposal why they would want to expose themselves to that possibility. Mr. Welsh opined that there is no realistic means to guarantee that you can stop a diesel runaway manually and felt that the necessity has been established. Mr. Welsh stated that consideration must be given to some of the scope issues raised by management and issues related to a phase-in period where employers would be provided the necessary time to bring their worksites in compliance with this standard.

Mr. Jorge Rincon, Safety Team Lead, Chevron North America, stated that there was no need to change the 50 feet rule to 100 feet since the industries safety record shows that when oil and gas well operations comply with the 50 feet rule, effective site safety is provided.

Mr. Bjerke stated that the industry is concerned about safety and feels that the accident data presented at the meeting indicates that the current standards are effective in preventing these types of accidents. Mr. Bjerke felt that the issues discussed at the meeting are important and that there could be changes to the current standard that makes sense to the industry and felt that there are still some issues, justification and data that need to be considered in order to come up with a reasonable proposal.

The Chairman noted that there appears to be a committee consensus that the AISV is effective in preventing diesel engine runaway but noted that there was no agreement on when and where the automatic AISV would be required. The Chairman stated that the committee would at this time review the proposed language.

Proposed §6554(h)(4) Stationary Internal Combustion Engine Driving Air or Gas Compressors.

Mr. Foss noted inconsistency in identifying hazardous locations of the proposed sections, including Section 6554(h)(4). Mr. Foss recommended using consistent terminology when identifying the hazardous locations.

Mr. Haddadin noted that for drilling operations, the industry outside the United States, such as in Canada, uses the 25 to 30 meter rule or approximately 100 feet from the well. Mr. Haddadin recommended using this same method to describe the hazardous location classifications as currently proposed.

Mr. Trombetta stated that, because of the type of work site and the fact that many of the smaller operators and contractors would not be familiar with definitions and determinations of hazardous

devices that will close off the combustion air should be installed on all diesel engines associated with drilling rigs and well servicing rigs. Section 9.15.3 recommends that spark arresters or equivalent equipment shall be provided on all internal combustion engine exhausts associated with drilling rigs and well servicing rigs located within 100 feet of the wellbore.

location classifications as defined in the Electrical Safety Orders, he was therefore in favor of using defined distances as given by the number of feet.

Mr. Van Howell, Federal OSHA, Region IX, supported changing the proposed language referencing hazardous location classifications and instead use the distance designation.

Mr. Simmons agreed that the use of hazardous location classifications is confusing and recommended keeping requirements simple and suggested using the 50 feet rule since the industry is already accustomed to this distance requirement. Mr. Simmons noted that the additional cost of installing AISVs on newly regulated diesel powered equipment as the result of the 100 feet radius rule is a significant factor to consider.

Mr. Foss noted that changing the hazardous classification terminology, mandating automatic AISVs on all stationary diesel engine driving air and gas compressors within 50 feet from the wellbore would include the Section 6554(h)(4) language. Mr. Foss encouraged Labor to compromise the 100 feet rule in favor of the 50 feet rule in order to have California be the only State in the nation to have such a standard.

Mr. Esparza stated that, irrespective of whether the committee agreed on the 50 feet or 100 feet rule, he felt that the proposal must include a requirement for the automatic AISV to avoid workers getting injured or killed when running toward the diesel engine in an attempt to manually stop a runaway condition.

Mr. Gough opposed requiring automatic AISV on all compressors and that other options should be permitted to control these hazards. Mr. Gough felt that the committee has to be careful when considering the requirement for automatic AISV and the changes to the size of the safety zone because of its wide range effect at the well site. Mr. Gough stated that because well sites have strict access controls, making changes to the current standard without carefully considering its implications would not be prudent.

The Chairman, responding to Mr. Gough's concerns stated that, if there is a consensus for the necessity to change to the diesel engine safety standard, the committee should come up with a rough draft of the proposed language. The Chairman proposed keeping the record open to provide for an additional 30 day comment period following the committee meeting to allow each committee member and his/her constituents to review and edit the proposed language to ensure the proposal is reasonable and effective in preventing diesel engine runaway conditions.

The Chairman asked the committee who agrees with the proposed 100 feet rule and who would be in favor of a 50 feet rule. The Chairman noted that most of the labor representatives but none of management representatives were in favor of the proposed 100 feet rule. When the Chairman proposed a 50 feet rule, labor and 50% of the management representatives did indicate support. The Chairman noted that there was more support to use the 50 feet rule and include this requirement in Section 6554(h)(4) requirements for diesel powered compressors to be equipped with an automatic AISV when located within 50 feet from the well. The Chairman reiterated that the committee would have 30 days to provide further comments to the proposal.

Proposed §6625(b)(3) & (4) Emergency Stop Device (for Prime Movers).

Mr. Foss summarized the Division recommended change that would add a definition for “actuation testing” in subsection (b)(5).

Mr. Rusti Risi, General Production Services, Inc. stated that his trucks routinely pull up to the well rig to drop off 300 to 500-pound tools or materials. Mr. Risi noted that the current proposal would require his entire diesel powered fleet to be equipped with AISVs even when these trucks spend only a few minutes within the safety zone.

Mr. Haddadin stated that vehicles that deliver equipment at several well sites on the same day are exposed to significant diesel engine runaway hazards. Mr. Haddadin felt that excluding specific diesel engines was not warranted, since the hazards posed by these engines would not be properly addressed for high risk operations and agreed that the scope should be refined to address high risk operations.

The Chairman suggested the committee consider adding language to address Mr. Risi’s concern; perhaps, an alternative would be to conduct air monitoring before restarting the engine to ensure the hazard is address.

Mr. Harmer stated that well sites are strictly controlled and that current control measures include a work and entry permit process that requires each contractor to complete a “Job Safety Analysis” consistent with company policies and which identifies all job related hazards and how the contractor intends to control them. Mr. Harmer stated that initial and continuous air monitoring for flammables and Hydrogen Sulfide is routinely conducted and insures that work proceeds safely. Because of the current safety practices in place, Mr. Harmer feels it is not reasonable to require all diesel engines at well sites to be equipped with AISVs. Mr. Harmer stated that the industry does not oppose the use of AISVs, but feels that other controls should be permitted during operations when the wellbore is open. Additionally, Mr. Harmer felt that AISV, emergency shut-down devices and control devices should be clearly defined.

Mr. Gough agreed with Mr. Harmer and stated that current industry wide practices limit access to the safety zone and require non-essential equipment and vehicles to park outside the safety zone. Current industry practices include constant monitoring of the wellbores as well as personal monitoring of employees to alert of gas or vapor releases. With regard to increasing the safety zone radius to 100 feet, Mr. Gough stated that because many of the access roads leading to company offices and maintenance shops are lined by operating wells the proposed increased radius of the safety zone may require all vehicles using these roads to be equipped with AISVs. Therefore, the proposed standard must clearly state what well operations are affected by these rules and which are not. Mr. Gough stated that gas and vapor releases occur when the wellbore is open, at which time it is appropriate and necessary to have controls in place to control diesel engine runaways. Mr. Gough therefore suggested that the scope of the proposal be narrowed to require AISVs when the well is open.

Mr. Foss asked the committee members if the proposal should exclude vehicular diesel engines and limit the requirements to prime movers as currently mandated and make the proposal more practical.

Mr. Crane stated that he does not understand industry objections for installing a \$1500 automatic AISV and considered it to be a cheap insurance policy. Mr. Crane agreed that an open wellbore would represent greater hazard related to releases of gas and vapor, however working wells that are being pumped are not self-contained and do release liquid and gas through the stuffing box. Mr. Crane added that even when the working well is pumping we see oil and gas releases through the stuffing box.

All management members agreed that requiring AISVs at all working wells would not be reasonable and that the standard should only apply to open wellbores and recommended including a definition for open wellbore to ensure clarity. Management supported regulating all diesel engines at 50 feet from an open wellbore and recommended using consistent terminology for AISV throughout the considered sections.

Mr. Patrick Bell, Division, recommended adding specific inspection frequencies and a record-keeping requirement for actuation testing in Section 6625(b)(4).

The Chairman noted that the proposed text in Section 6625(b) would include the requirement in subsection (b)(3) that diesel engines within 50 feet from the open wellbore be equipped with automatic AISVs; in subsection (b)(4), all AISVs would be required to undergo actuation testing; and subsection (b)(5) would define the actuation test. At this point in the deliberations, the Chairman requested that within the next 30 days the committee provide:

- 1) Recommendations for a definition for the AISV
- 2) Specific recommendations regarding actuation testing frequencies and record keeping requirements for AISVs, and
- 3) Any fine tuning of the language and the scope of the proposal.

The Chairman asked if anyone had concerns with the current draft of the proposed Section 6625 as so far agreed on. Hearing no objections the Chairman directed the committee to proceed to the proposed Section 6651 language.

Proposed §6651(c) & (d). Loading and Unloading Operations.

Mr. Foss summarized the Division recommended changes stating that the “certified automatic AISVs” in subsection should be changed to “approved automatic AISVs.” Additionally, Mr. Foss noted that vacuum trucks are involved in diesel engine runaways and stated that, unlike delivery vehicles, these trucks are specialized to service well sites and therefore should be regulated under this proposal.

Mr. Gough noted that the proposed language is consistent with his company’s operations.

Mr. Rosenlieb, Health, Safety and Risk Manager, KVS Transportation Inc., supported the proposed language in subsection (c) for vacuum trucks used to transfer flammable liquids, the diesel engines involved with the transfer must be equipped with an automatic AISV.

Proposed §6651(d) and §6684(a) & (b) Re: Cyclone Spark Arrester Requirements

The Chairman asked for committee comments regarding the proposed cyclone type spark arresters in Section 6651(d) for trucks and vacuum trucks unloading and loading of flammable liquids and Section 6684(a)(b) for prime movers within 100 feet of the casing of all drilling wells.

Mr. Gough felt that the very prescriptive proposal for cyclone type spark arresters should be rejected and that amending the current performance-based requirement is not necessary. Mr. Gough noted that any future spark arrester technologies would be prohibited if the proposal is adopted.

Mr. Hrenchir agreed with Mr. Gough that it would be unreasonable to require only one type of spark arrester when good alternatives are currently available. Mr. Hrenchir stated that if a spark arrester no longer works it becomes a maintenance issue that is already addressed in subsection (c). Mr. Hrenchir recommends retaining the current performance based spark arrester standard.

Mr. Bjerke stated that the industry would have no problem with a requirement for spark arresters on trucks loading and unloading flammable liquids, but that requiring one type of spark arrester is unnecessary and counterproductive. Mr. Bjerke stated that the proposed spark arrester standard would require us to return to the advisory committee process when future technological advances lead to a better spark arrester.

Mr. Bhalla stated that he developed the language from the European standard for the cyclone type design with a requirement for corrosion and abrasion resistance.

Mr. Haddadin suggested that the language be changed to require approved spark arresters, since the requirement for stainless steel is a function of durability and probably does not need to be included.

The Chairman asked the committee for further comments regarding the spark arrester issue.

Both labor and management agreed that the existing Title 8 standard should be retained and therefore rejected going forward with proposed Sections 6651(d) and §6684(a) & (b). Both labor and management representatives suggested that if at a future date it appears necessary to make changes to the spark arrester standard the Board can be approached to address it at that time.

The Chairman reviewed the agreed upon elements of the proposal as follows:

- 1) A requirement that diesel engines within 50 feet of open wells be equipped with an automatic AISV which includes:
 - a) Diesel powered air and gas compressor requirements in Section 6554
 - b) Diesel engine powered prime movers in Section 6625.
 - c) Vehicular diesel engines (a new requirement)
- 2) Diesel engines used to transfer flammable liquids during truck and vacuum truck loading and unloading operations to be equipped with automatic AISVs.

The Chairman reiterated to the committee that the record would remain open for the next 30 days in order to allow for further input regarding the following:

- 1) Recommendations for a definition for the AISV
- 2) Recommendations for a definition for Prime Movers
- 3) Recommendations for a definition for Open Wellbore
- 4) Specific recommendations regarding actuation testing frequencies and record keeping requirements for AISVs, and
- 5) Any fine tuning of the language and the scope of the proposal in Sections 6554, 6625, and 6651.

Before adjourning the meeting the Chairman asked if there were further questions or comments.

There being no further comments or questions the Chairman adjourned the meeting at approximately 4:30 PM.

COMMENTS RECEIVED AS THE RESULT OF THE 30 DAY COMMENT PERIOD FROM
FEBRUARY 9 THROUGH MARCH 15, 2011

Mr. Jogen Bhalla, Petitioner, via e-mail dated 3/7/2011

Comment No. 1: Mr. Bhalla recommended the following:

- 1) Amend the proposed language in Section 6554(h)(4) to include a requirement for an automatic AISVs on diesel engine powered compressors within 50 feet of the boundary limits of an operating unit in production as well as 50 feet from all wellbores.
- 2) Amend the proposed language in Section 6625(b)(2) for all AISVs for diesel engines defined as prime movers at oil and gas well lease sites to be equipped with approved and automatic AISVs.
- 3) Amend the proposed language in Section 6625(b)(2) by changing the 50 feet rule to 100 feet rule and changing the "open wellbore" limits to include "wells that are under drilling, completion, servicing, or abandonment." The change would also add a requirement for all stationary, vehicular and mobile diesel engines operating within 100 feet of the boundary limits of an operating unit in production to be equipped with approved automatic AISVs.
- 4) Amend the proposed language in the proposed new Section 6625.1 to correspond to the above recommended changes.
- 5) Use the term "Air intake shut-off valve" in place of emergency shut-down device, air intake shut-off device, etc. for consistency.
- 6) Define the term "Prime Mover" as "an engine or motor whose main function is to drive or operate other mechanical equipment like mobile and vehicular engines."
- 7) Define the term "Open wellbore" as any wellbore in drilling, completion, service, wireline, coil tubing, abatement in which casing has not been set.

Mr. Jogen Bhalla, Petitioner, via e-mail dated 3/8/2011

Comment No. 2: Mr. Bhalla noted that the 100 feet rule can be confirmed based on findings in a Mary Kay O'Connor Process Safety Center study that concluded that when LNGs heats up, it becomes buoyant and can easily cover 30 meters of distance.

Mr. George Harmer, Safety Manager, GPS, via e-mail dated 3/10/2011

Comment No. 3: Mr. Harmer indicated that after further review of the safety data and discussions with contractors and producers he felt that accident data for California does not support the necessity to regulate vehicular and mobile diesel engines under the proposed standard. Mr. Harmer considers the proposal for increased safety zone of 100 feet impractical, because lease access roads are constructed directly adjacent to locations that may have an open wellbore. Mr. Harmer stated that the proposal should only apply to diesel engines on drilling and production rigs. Mr. Harmer supported all other elements of the proposal and recommended that the committee convene again for further discussion of the proposal.

Mr. Guy Bjerke, Manager, Bay Area Region, Western States Petroleum Association (WSPA), via e-mail dated 3/11/2011

Comment No. 4: Mr. Bjerke stated that the necessity for the proposal has not been demonstrated, since the majority of the accidents appear to have occurred outside California. Mr. Bjerke noted that had these operations complied with current California production site regulations the accidents would not have occurred. Mr. Bjerke stated that current Cal/OSHA regulations effectively control the type of hazards identified in the petition. Mr. Bjerke stated that other California regulatory agencies like the local Air Pollution Control Districts, and California Division of Oil, Gas and Geothermal Resources further minimize the potential for drilling or well servicing related hydrocarbon releases and feels that consideration needs to be given to the differences in physical properties of oil, such as its API gravity to determine the necessity of the proposed standards. Mr. Bjerke stated that WSPA strongly encourages the Board to take a risk-based approach with regard to this petition. Mr. Bjerke stated that the proposed changes will cost the industry millions of dollars to retrofit drilling and well service related equipment. Mr. Bjerke felt that a thorough economic impact and cost/benefit analysis should be made before proceeding with this proposal. Mr. Bjerke stated that WSPA members suggest that, instead of moving forward with the proposal, the Board should review and address the more narrowly focused concerns about the use of vacuum trucks.

Rick Latham, Sub District Director, United Steel Workers, District 12, via e-mail dated 3/14/2011

Comment No. 5: Mr. Latham stated that he agreed with Mr. Bhalla's March 7, 2011 email regarding the necessity and justification for the 100 feet versus 50 feet from the wellhead. Mr. Latham stated vehicles should not be exempted from the standard because they account for the

overwhelming majority of the ignition sources in the known accidents. Mr. Latham felt that economic arguments are out of place in this instance.

Rusty Risi, President, General Production Service, via e-mail dated 3/15/2011

Comment No. 6: Mr. Risi stated that it has been an industry wide standard that circulating pumps, work over and production rigs be equipped with AISVs. Because the diesel engines of circulating pumps, work over and production rigs are always within 50 feet of the well, increasing that requirement to 100 feet does not affect his equipment. However, Mr. Risi did not feel it necessary to include vehicular diesel engines in the standard as indicated by accident data. Mr. Risi noted that because all these incidents occurred during operation on open wellbores, the proposed regulation should not apply to closed wellbores. Mr. Risi encouraged continued dialog between committee members to come to consensus on these issues.

POST ADVISORY COMMITTEE SUMMARY

As the result of review of the committee discussions and written comments submitted after the committee meeting, accident data and other consensus standards, Board staff recognizes the following:

- 1) Accident data reviewed during the committee meeting shows a total of three reported accidents in California and four accidents in other states at the type of well sites subject to the Petroleum Safety Orders, Subchapter 14. Two additional out-of-state accidents presented during the meeting involved vacuum trucks at bulk and chemical facilities not at an oil or gas well site.
- 2) Accident data presented at the committee meeting panned from January 1990 though the present showed that all accidents at sites subject to Gas Oil Well Drilling and Production standards occurred at open wellbores [emphasis added].
- 3) All well site accidents occurred while the well was undergoing drilling, testing, maintenance, work-over or abandonment operations when blowout preventers, valves or other well head containment systems had been removed or opened.
- 4) All accidents appear to have occurred in the immediate vicinity of the open well.
- 5) No data or verifiable information was provided to indicate that runaway conditions have occurred beyond the 50 feet radius from the open wellbore.
- 6) Accident data shows that on several occasions employees were injured or killed while running towards the runaway diesel engine to actuate the AISV.
- 7) Canadian Standards presented during the committee meeting to support the petitioner's proposed 100 feet rule and the automatic AISV requirement vary greatly from Province to Province. One Province uses a prescriptive standard with a requirement for a safety zone radius of 38 feet, another Province requires a radius of 75 feet, and yet another requires a radius of 80 feet. With regard to the requirement for an automatic AISV, all the Provinces with prescriptive standards mandate automatic AISV but also permit the use of alternative methods or devices as viable controls against diesel engine runways. These alternatives include a) monitoring for flammable gasses and vapors, b) manual AISV with remote controls at the operator station, c) ducting combustion air from uncontaminated areas, d)

- and other approved effective devices. Two Provinces use a performance based standard to determine when AISV are required.
- 8) The Canadian standards appear to be effective in preventing runaway conditions since no significant diesel engine runaway accidents could be identified at Canadian oil and gas drilling and production sites, except for a minor accident identified by Mr. Bhalla.
 - 9) To prevent workers from running toward the runaway engine in order to activate the AISV, the AISV should be equipped with a remote actuation control readily accessible to the operator, or the AISV should be automatically actuated.
 - 10) Continuous airborne contaminant monitoring is routinely performed at drilling and production sites in California.

As the result of the above findings and the fact that drilling and production workers at open wellbores are injured or killed while running towards the runaway diesel engines in order to actuate the AISV, Board staff recommends a more prescriptive standard for diesel runaway standards. Board staff therefore proposes a standard similar to the prescriptive Canadian standards. Because accident data shows all reported accidents occurred within 50 feet from the open wellbore, the proposal mandates a 50 feet rule.