MEMORANDUM

TO:               NFPA Technical Committee on Operations
FROM:             Joanne Goyette
DATE:             October 25, 2010
SUBJECT:          NFPA 30 ROC TC Letter Ballot (A2011)

The ROC letter ballot for NFPA 30 is attached. The ballot is for formally voting on whether or not you concur with the committee’s actions on the comments. Reasons must accompany all negative and abstention ballots.

Please do not vote negatively because of editorial errors. However, please bring such errors to my attention for action.

Please complete and return your ballot as soon as possible but no later than Monday, November 8, 2010. As noted on the ballot form, please return the ballot to Joanne Goyette either via e-mail to jgoyette@nfpa.org or via fax to 617-984-7110. You may also mail your ballot to the attention of Joanne Goyette at NFPA, 1 Batterymarch Park, Quincy, MA 02169.

The return of ballots is required by the Regulations Governing Committee Projects.

Attachments: Comments
the use of "non-sparking" tools in flammable atmospheres.

To eliminate sources of ignition in places where low flashpoint liquids are used or handled, provisions shall be made to promptly and safely dispose of leakage or spills. Tools used shall be spark resistant.

Substantiation: In response to the original proposal the Committee expressed multiple concerns. The following is intended to discuss each of these concerns:

1. The Committee cites “the work of the American Petroleum Institute (API 2214), which refuted the need for non-sparking tools, except in very special circumstances.” However, information presented below shows API 2214 is misleading and undermines safe work practices.

- FM Approvals LLC, formerly Factory Mutual Research Corporation (FM) is an international organization recognized by the U.S. government as a Nationally Recognized Testing Laboratory (NRTL) for scientific research and product certification. Product approval from a NRTL assures that products meet consensus-based standards of safety to provide the assurance, required by OSHA, that these products are safe for use in the United States workplace. FM Approval Standard 7910, Spark Resistant Tools is used as guidance to evaluate tools intended for use in environments where there is a risk of ignition of flammable materials, dusts or vapors resulting from sparks created by iron and steel hand tools. These tools prevent the ignition of flammable materials, dusts or vapors by mechanical sparks created by the use of iron and steel hand tools slipping or striking a surface. American Petroleum Institute (API) Publication 2214 contradicts NRTL research and product certification as evidence in FM Approvals granted for spark resistance tools. FM has conducted a test as covered in Report Job Identification No. IN4A0.AF in accordance with the requirements of Safety Tools Approval Test Procedure, Class 7910 and test results show:
  - Sparks created from steel plates ignited carbon disulfide saturated pads, eight of eight tests, ethyl ether pads, five of eight tests, and naphtha VM&P four of eight tests.
  - No sparks were observed and no ignition of the flammable liquids mentioned above from approved safety Tools.
  - Other investigations also contradict API’s conclusion on non-sparking tools. A paper published in the Fire Protection Journal, “The Danger of Incendive Sparks”, stated that after API’s conclusion on “non-sparking” tools, Institute of Petroleum sought the advice of the Fire Research Board Committee on Industrial Fires and Explosion. This committee came to certain conclusions, one of which was “Until…evidence is obtained to show that the impact of steel hand tools on steel is safe, it is advisable to use non-sparking tools in situations where flammable atmospheres are unavoidable”.

- The NFPA Fire Protection Handbook, 20th edition, published in January 2008, does not support the conclusion that API 2214 represents. In fact, many NFPA codes require the use of “non-sparking” tools in flammable atmospheres. According to NFPA Fire Protection Handbook, “When flammable and combustible liquids are stored or handled, the liquid is usually exposed to the air at some stage in the operation, except where the storage is confined to sealed containers that are not filled or opened on the premises or where handling is in closed systems and vapor losses are recovered. Even when the storage or handling is in a closed system, there is always the possibility of breaks or leaks, which permit the liquid to escape. It is a good practice to eliminate sources of ignition in places where low flashpoint flammable liquids are stored, handled, or used, even though no vapor may ordinarily be present.”

- OSHA Flammable and Combustible Liquids regulation, 29 CFR Parts 1910.106(b) on tank storage, paragraph 1910.106(b)(6) states that precaution shall be taken to eliminate or control sources of ignitions including frictional heat and mechanical sparks to prevent the ignition of flammable vapors.

- NFPA 921, Guide for Fire and Explosion Investigations 2008 Edition, Chapter 5 Basic Fire Science Table 5.7.1.1 Reported Burning and Sparking Temperature of Selected Ignition Sources under Mechanical Sparks lists a Steel tool temperature at 2550°F. When working with flammable gases, liquids or vapors, a potential hazard arises because of the possibility that sparks produced by steel or iron tools can become an ignition source.

- Recognizing the potential for steel tools to be an ignition source in flammable environment, the Occupational Safety & Health Administration (OSHA) provides guidance in booklet 3080 Hand and Power Tools, 2002 revised, “iron and steel hand tools may produce sparks that can be an ignition source around flammable substances. Where this hazard exists, spark-resistant tools should be used.”

- In OSHA regulation 29 CFR 1910.146 Permit-Required Confined Spaces, Appendix D Confined Space Pre-Entry Check List, non-sparking tool is listed as one type of entry equipment. OSHA 29 CFR 1910.146 Standard Interpretations, Interpretative guidance and equipment approved for hazardous locations relative to the Permit-Required
Confined Spaces states that “...the standard does not prohibit entry into a permit space where a hazardous flammable atmosphere is at or above the 10% LFL. For concentrations at or above 10% LFL, paragraph (d) would require the employer to incorporate safe work procedures to address the flammable/explosive hazard (such as equipment approved for hazardous locations) in the entry plan for those spaces. Electrical equipment as well as other sources of ignition (non-sparking hand tools) must be considered and addressed for the hazardous atmosphere.”

U.S. Environmental Protection Agency (EPA) has identified hazardous wastes from industry specific sources known as the K-List. Under petroleum refining section, used hydrotreating catalyst (K171) and used hydrorefining from petroleum refining operations (K172) are identified as ignitable hazardous wastes. EPA also identifies solvents such as xylene, acetone, ethyl acetate, ethyl benzene and ethyl ether commonly used in all industries (the F-list) and discarded commercial chemical products such as acetone, benzene, ethyl ether and xylene (the P-list and U-list) as ignitable hazardous wastes. OSHA regulation 29 CFR Parts 1910.120, Hazardous waste operations and emergency response, paragraph 1910.120(j)(2)(v) requires that “When there is a reasonable possibility of flammable atmospheres being present, material handling equipment and hand tools shall be of the type to prevent sources of ignition.

Even API members such as ExxonMobil and Chevron as well as others in the petroleum industry such as Valero, CITGO Petroleum Corporation, Chem-Supply, Pty Ltd, Irving Oil Ltd, Petrol Star Inc, Nova Chemicals and El Paso Corporation list “non-sparking” tools under Accidental Release Measures and Handling and Storage sections in the MSDS’s for their petroleum products. These companies clearly recognize the need for “non-sparking” tools in working with and around flammable materials. Clearly, API 2214 conflicts with OSHA regulations, Accredited Standards Developer’s standards and safe work practices.

2. The Committee stated that “the Committee is not aware of any pattern of fire incidents that can be linked to the use of ferrous tools. This is anecdotal information that does not indicate a significant fire hazard pattern.”

The Report of the BP U.S. Refineries independent Safety Review Panel, also known as the Baker Panel Report, states that “Preventing process accidents requires vigilance. The passing of time without a process accident is not necessarily an indicator that all is well and may contribute to a dangerous and growing sense of complacency.” Listed below are accidents caused by sparks from metal tools demonstrating that ferrous tools can be an ignition source in flammable environments.

- OSHA inspection # 300965795, an employee in the process of cleaning loose material from drill piping with a metal hammer. While striking the pipe with a hammer, an explosion occurred. Employee was killed in the explosion on site.

- OSHA inspection # 2272953, two employees were assigned the job of tending a 100 gallon (water jacket) reactor kettle of methyl methacrylate in the mixing room. Employee #1 used a metal wrench (visegrips) to pry open the cover of a kettle. The wrench handle struck the angle iron support for the agitator motor, producing a spark. Employee #2 noticed the spark, which was immediately followed by a massive “fire ball”. Both employees were engulfed in the fireball. Employee #3 came to the area to assist the other employees. The investigation states that non-sparking tools were not provided for the employees. All three employees received first and second degree burns on their face, arms and abdomen. Employee #2 also received some third degree burns. All three employees were hospitalized.

- OSHA inspection # 124728437, Employee #1 and a coworker, both maintenance mechanics, were working in a 30 inch by 36 inch manhole at a gas station. Employee #1 was trying to change a fuel pump, while the coworker watched from outside the manhole. Employee #1 was using an Allen wrench to loosen the bolts on the fuel pump lead when he created a spark that ignited the gas fumes in the manhole, causing an explosion. Employee #1 suffered burns to his face, hands, arms and legs in the explosion and was hospitalized.

- OSHA inspection # 111109237, Employee #1 or #3 attempted to cut a metal pipe with a metal saw while Employee #2 was standing on top of one of two 5,000 gallon gas tanks, trying to remove a tank fitting. Sparks from the saw, the pipe wrench, or another unknown source ignited the gas vapors, which exploded. Employees #1 and #3 were killed of burns at the scene. Employee #2 died at the burn center as a result of burns sustained in the explosion.

- OSHA inspection # 102826625, Employee #1 worked for a company that cleans paints and replaces valves in LP and MAPP gas cylinders. Before removing an old valve, Employee #1 would open the valve to let the residual gas leak out on the loading dock. Where there was a large quantity of cylinders, Employee #1 would invert the cylinder so the residual gas could vent faster. Employee #1 had an accumulation of a gas and air mixture around his work area. The vapors were ignited either by a spark from the metal screwdriver he was using to open a damaged valve or by an open flame burner approximately 40 feet away. There was a fire and explosion. The employee sustained 2nd and 3rd degree burns on the lower half of his body and was hospitalized.

- OSHA inspection # 607366, an employee was sawing an airplane wing into sections with a portable powered hand saw, the saw created a spark that caused an explosion of gasoline vapors in the wing fuel tank. Employee #1 killed and Employee #2 injured in explosion and was hospitalized.

These examples of OSHA documented accidents illustrates that accidents do happen when proper safety measures
are not taken against mechanical sparks from steel tools as a possible ignition source. We are not equipped to show specific fire hazard patterns but would welcome any resources the Committee is aware of that are publicly available. However, the Deputy Assistant Secretary of OSHA stated to Congress in June, 2010 that “Conventional injury and illness rates are not adequate indicators of the risk of fires, explosions, or other catastrophic accidents, and companies need to develop better leading indicators to assess risks in their workplaces”.

3. The Committee refutes the statement that the US Department of Transportation’s Emergency Response Guide (ERG) “requires” the use of non-sparking tools and that the ERG is a guide, not a mandatory document. However, OSHA regulation 29 CFR 1910.120(q)(6)(ii)(E) and EPA regulation 40 CFR 311 both recognize the value of the ERG by requiring responders to be trained regarding its use. The ERG specifies the use of “non-sparking tools” to handle spills or leaks for flammable liquids in Guide 127 Flammable Liquids (Polar/Water-Miscible), Guide 128 Flammable Liquids (Non-Polar/Water-Immiscible), Guide 129 Flammable Liquids (Polar/Water-Miscible/Noxious), Guide 130 Flammable Liquids (Non-Polar/Water-Immiscible/Noxious), Guide 131 Flammable Liquids – Toxic, Guide 132 Flammable Liquids – Corrosive.

4. The Committee stated that the Committee is not aware of corporate standards that mandate non-sparking tool use, except for those industries dealing with explosive materials and energetic propellants. 29 CFR 1910.1200(g) (2) (viii) requires MSDS to include “protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks” among others. 29 CFR 1910.1200(h)(3)(iii) further requires employers to include the measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used”. In fact, OSHA issues citations for not using non-sparking tools as recommended by manufacturer’s MSDS (i.e. OSHA inspection# 304994304). Furthermore, OSHA Standard Interpretation, December 22, 2008, “Requirements of the Hazard Communication Standard (HCS) and the Employer's Ability to Rely on a Manufacturer's Hazard Determination” also states that “Additionally, if an employer has sufficient information about a potential health hazard for which no information is provided on the MSDS, it must provide employees with additional information and training regarding those new hazards. Based on the performance oriented nature of the HCS, if employers have this information, they must provide it to their employees, including information related to how employees can recognize exposures and measures to protect themselves against the workplace hazards. 29 CFR 1910.1200(h).”

Again, API members such as ExxonMobil and Chevron as well as others in the petroleum industry such as Valero, CITGO Petroleum Corporation, Chem-Supply, Pty Ltd, Irving Oil Ltd, Petrol Star Inc, Nova Chemicals and El Paso Corporation list “non-sparking” tools under Accidental Release Measures and Handling and Storage sections in the MSDS’s for their petroleum products. As stated previously, OSHA HCS requires employer to provide measures to protect employees. A feasible measure to control ignition hazard associated with steel tools is to use spark resistant tools as listed on manufacturers’ MSDS.

5. The Committee stated that field compliance directives of the US Occupational Safety and Health Administration have recognized that non-sparking tools need not be mandated. We are perplexed by the Committee’s statement. For example, OSHA Directive CPL 02-02-071, Technical Enforcement and Assistance Guidelines for Hazardous Waste Site and RCRA Corrective Action Clean-up Operations, Section II, Compliance Check List, item 12 “If a flammable atmosphere might be present during drum and container handling, is the potential for ignition minimized through the use of non-sparking hand tools and material handling equipment designed to prevent sources of ignition?” This compliance checklist lists when specifically non-sparking tools are to be used and help the compliance officer to understand if the employer is in compliance. Another example, OSHA Directive CPL 02-00-142, Shipyard Employment Tool Bag Directive, 29 CFR 1910, Subpart H: Hazardous Materials, section 1910.107(g), “...except for 1910.107(g)(2), which is generally preempted by 1915.35(b)(6) for non-sparking tools used in painting spaces…” 29 CFR 1915.35(b)(6) requires “Only non-sparking paint buckets, spray guns and tools shall be used. Metal parts of paint brushes and rollers shall be insulated. Staging shall be erected in a manner which ensures that it is non-sparking.”

OSHA has also issued citations for not using non-sparking tools, for example, OSHA inspection# 313523375, a composite manufacturer was cited for violation of OSHA flammable and combustible liquids regulation 29 CFR 1910.106(h)(7)(i)(a) that precaution was not taken to prevent the ignition of flammable vapors. The employer did not use non-spark producing tools in areas listed by the employer as Class I Division I locations. Process Technicians in building used a T-Wrench tool(s) that were not made of non-sparking material to secure and unsecure manway bolts on kettle reactor vessels and blend tank manway covers. This exposed process technicians and other employees to an explosion and fire hazard, in-that a spark can potentially be produced while using the tool, igniting potentially present flammable vapors from the process vessel during charging process. A few more examples of OSHA citations for not using non-sparking tools include OSHA inspection# 309178523, 17857228, 122021017, 313996118, 302920400, and 309178523.

We respectfully request the Committee to reconsider and implement a safer practice to control ignition sources with

spark resistant tools. Without this specification, ferrous tools are likely to be used which can be an ignition source. However, if upon further consideration, the Committee still does not see the need for restricting ferrous tools in flammable atmospheres, we ask the Committee to at least include the proposed text in Annex text to raise the awareness of ignition hazard associated with ferrous tools in direct contact with flammable materials.

This is not original material; its reference/source is as follows:

Committee Meeting Action: Reject

Committee Statement: The proposed language would apply a requirement to use spark resistant tools to the clean up of all spills involving all flammable and combustible liquids. The actual need for spark resistant tools would only be justified for a few flammable liquids. The NFPA 30 Technical Committee on Operations agrees with the action taken by the NFPA 30 Technical Committee on Fundamentals by means of Comments 30-5 (Log #3) and 30-16 (Log #CC1) as addressing this issue.

30-10 Log #7 FLC-OPS (18.6 (New) ) Final Action: Accept in Principle

Submitter: Thomas W. Jaeger, Jaeger and Associates, LLC
Comment on Proposal No: 30-143
Recommendation: Delete the entire proposed new Section 18.6 and add new Sections

1.1.3* This code shall not apply to the use and installation of alcohol-based hand rub (ABHR) dispensers.
A.1.1.3 The requirements for the use and installation of alcohol-based hand rubs are covered in NFPA 1, Fire Code and NFPA 101, Life Safety Code.
1.5.3(12) Installations made in accordance with the applicable requirements of the following standards shall be deemed to be in compliance with this code:
(1) ----
(11) Chapter 10 of NFPA 99, Standard for Health Care Facilities
(123) NFPA 5000, Building Construction and Safety Code

Substantiation: I was the submitter of proposal 30-143 as well as the submitter of proposals to NFPA 1 and 101 for alcohol based hand rubs. Both NFPA 1 and 101 accepted the proposals for the use and installation of ABHR’s. ABHR’s are now adequately addressed and coordinated in these two documents. It seems unnecessary and redundant to address the ABHR’s again in NFPA 30. This also eliminates any potential conflicts relative to MAQ’s. ABHR’s at one time were solely used and installed in health care facilities but due the public’s concern for the swine flu and other diseases are now used and installed in most occupancies and the use and installation of these dispensers needed to be addressed in standards commonly used to regulate a variety of occupancies.

Committee Meeting Action: Accept in Principle

Refer this comment to the NFPA 30 Technical Committee on Fundamentals with a recommendation to add the proposed text as item (9) of Subsection 1.1.2

Committee Statement: While the NFPA 30 Technical Committee on Operations agrees with the submitter, the proposed text resides in Chapter 1, which is the responsibility of the NFPA 30 Technical Committee on Fundamentals.
the use of "non-sparking" tools in flammable atmospheres. To eliminate sources of ignition in places where low flashpoint liquid is usually exposed to the air at some stage in the operation, except where the storage is confined to sealed containers that are not filled or opened on the premises or where handling is in closed systems and vapor losses are recovered. Even when the storage or handling is in a closed system, there is always the possibility of breaks or leaks, which permit the liquid to escape. It is a good practice to eliminate sources of ignition in places where low flashpoint flammable liquids are stored, handled, or used, even though no vapor may ordinarily be present."

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Recognizing the potential for steel tools to be an ignition source in flammable environment, the Occupational Safety & Health Administration (OSHA) provides guidance in booklet 3080 Hand and Power Tools, 2002 revised, "Iron and steel hand tools may produce sparks that can be an ignition source around flammable substances. Where this hazard exists, spark-resistant tools should be used."

In OSHA regulation 29 CFR 1910.146 Permit-Required Confined Spaces, Appendix D Confined Space Pre-Entry Check List, non-sparking tool is listed as one type of entry equipment. OSHA 29 CFR 1910.146 Standard Interpretations, Interpretative guidance and equipment approved for hazardous locations relative to the Permit-Required

19.5.7.5* Friction Heat or Sparks from Mechanical Equipment. Mechanical equipment used to move vapors that are in the flammable range shall be designed to prevent sparks or other ignition sources under both normal and equipment malfunction conditions. Tools used shall be spark resistant.

Substantiation: In response to the original proposal the Committee expressed multiple concerns. The following is intended to discuss each of these concerns:

1. The Committee cites "the work of the American Petroleum Institute (API 2214), which refuted the need for non-sparking tools, except in very special circumstances." However, information presented below shows API 2214 is misleading and undermines safe work practices.

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  - No sparks were observed and no ignition of the flammable liquids mentioned above from approved safety Tools.
  - Other investigations also contradict API's conclusion on non-sparking tools. A paper published in the Fire Protection Journal, "The Danger of Incendive Sparks", stated that after API's conclusion on "non-sparking" tools, Institute of Petroleum sought the advice of the Fire Research Board Committee on Industrial Fires and Explosion. This committee came to certain conclusions, one of which was "Until…evidence is obtained to show that the impact of steel hand tools on steel is safe, it is advisable to use non-sparking tools in situations where flammable atmospheres are unavoidable".
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However, OSHA regulation 29 CFR 1910.120(q)(6)(i)(E) and EPA regulation 40 CFR 311 both recognizes the value of the ERG by requiring responders to be trained regarding its use. The ERG specifies the use of “non-sparking tools” to handle spills or leaks for flammable liquids in Guide 127 Flammable Liquids (Polar/Water-Miscible), Guide 128 Flammable Liquids (Non-Polar/Water-Immiscible), Guide 129 Flammable Liquids (Polar/Water-Miscible/Noxious), Guide 130 Flammable Liquids (Non-Polar/Water-Immiscible/Noxious), Guide 131 Flammable Liquids – Toxic, Guide 132 Flammable Liquids - Corrosive.

4. The Committee stated that the Committee is not aware of corporate standards that mandate non-sparking tool use, except for those industries dealing with explosive materials and energetic propellants. 29 CFR 1910.1200(g) (2) (viii) requires MSDS to include “protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks” among others. 29 CFR 1910.1200(h)(3)(iii) further requires employers to include the measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used”. In fact, OSHA issues citations for not using non-sparking tools as recommended by manufacture’s MSDS (i.e. OSHA inspection# 304994304). Furthermore, OSHA Standard Interpretation, December 22, 2008, “Requirements of the Hazard Communication Standard (HCS) and the Employer's Ability to Rely on a Manufacturer's Hazard Determination” also states that “Additionally, if an employer has sufficient information about a potential health hazard for which no information is provided on the MSDS, it must provide employees with additional information and training regarding those new hazards. Based on the performance oriented nature of the HCS, if employers have this information, they must provide it to their employees, including information related to how employees can recognize exposures and measures to protect themselves against the workplace hazards. 29 CFR 1910.1200(h).”

Again, API members such as ExxonMobil and Chevron as well as others in the petroleum industry such as Valero, CITGO Petroleum Corporation, Chem-Supply, Pty Ltd, Irving Oil Ltd, Petrol Star Inc, Nova Chemicals and El Paso Corporation list “non-sparking” tools under Accidental Release Measures and Handling and Storage sections in the MSDS’s for their petroleum products. As stated previously, OSHA HCS requires employer to provide measures to protect employees. A feasible measure to control ignition hazard associated with steel tools is to use spark resistant tools as listed on manufacturers’ MSDS.

5. The Committee stated that field compliance directives of the US Occupational Safety and Health Administration have recognized that non-sparking tools need not be mandated. We are perplexed by the Committee’s statement. For example, OSHA Directive CPL 02-02-071, Technical Enforcement and Assistance Guidelines for Hazardous Waste Site and RCRA Corrective Action Clean-up Operations, Section II, Compliance Check List, item 12 “If a flammable atmosphere might be present during drum and container handling, is the potential for ignition minimized through the use of non-sparking hand tools and material handling equipment designed to prevent sources of ignition?” This compliance checklist lists when specifically non-sparking tools are to be used and help the compliance officer to understand if the employer is in compliance. Another example, OSHA Directive CPL 02-00-142, Shipyard Employment Tool Bag Directive, 29 CFR 1910, Subpart H: Hazardous Materials, section 1910.107(g), “…except for 1910.107(g)(2), which is generally preempted by 1915.35(b)(6) for non-sparking tools used in painting spaces…” 29 CFR 1915.35(b)(6) requires “Only non-sparking paint buckets, spray guns and tools shall be used. Metal parts of paint brushes and rollers shall be insulated. Staging shall be erected in a manner which ensures that it is non-sparking.”

OSHA has also issued citations for not using non-sparking tools, for example, OSHA inspection# 313523375, a composite manufacturer was cited for violation of OSHA flammable and combustible liquids regulation 29 CFR 1910.106(h)(7)(i)(a) that precaution was not taken to prevent the ignition of flammable vapors. The employer did not use non-spark producing tools in areas listed by the employer as Class I Division I locations. Process Technicians in building used a T-Wrench tool(s) that were not made of non-sparking material to secure and unsecure manway bolts on kettle reactor vessels and blend tank manway covers. This exposed process technicians and other employees to an explosion and fire hazard, in-that a spark can potentially be produced while using the tool, igniting potentially present flammable vapors from the process vessel during charging process. A few more examples of OSHA citations for not using non-sparking tools include OSHA inspection# 309178523, 17857228, 122021017, 313996118, 302920400, and 309178523.

We respectfully request the Committee to reconsider and implement a safer practice to control ignition sources with
spark resistant tools. Without this specification, ferrous tools are likely to be used which can be an ignition source. However, if upon further consideration, the Committee still does not see the need for restricting ferrous tools in flammable atmospheres, we ask the Committee to at least include the proposed text in Annex text to raise the awareness of ignition hazard associated with ferrous tools in direct contact with flammable materials.

This is not original material; its reference/source is as follows:

Committee Meeting Action: Reject

Committee Statement: Section 19.5 applies to vapor recovery and vapor processing systems only and not to the use of tools. See also Comments 30-5 (Log #3), 30-9 (Log #4), and 30-16 (Log #CC1).
The Committee cites "the work of the American Petroleum Institute (API 2214), which refuted the need for non-sparking tools, except in very special circumstances." However, information presented below shows API 2214 is misleading and undermines safe work practices.

- FM Approvals LLC, formerly Factory Mutual Research Corporation (FM) is an international organization recognized by the U.S. government as a Nationally Recognized Testing Laboratory (NRTL) for scientific research and product certification. Product approval from a NRTL assures that products meet consensus-based standards of safety to provide the assurance, required by OSHA, that these products are safe for use in the United States workplace. FM Approval Standard 7910, Spark Resistant Tools is used as guidance to evaluate tools intended for use in environments where there is a risk of ignition of flammable materials, dusts or vapors resulting from sparks created by iron and steel hand tools. These tools prevent the ignition of flammable materials, dusts or vapors by mechanical sparks created by the use of iron and steel hand tools slipping or striking a surface. American Petroleum Institute (API) Publication 2214 contradicts NRTL research and product certification as evidence in FM Approvals granted for spark resistance tools.

- The NFPA Fire Protection Handbook, 20th edition, published in January 2008, does not support the conclusion that API 2214 represents. In fact, many NFPA codes require the use of "non-sparking" tools in flammable atmospheres. According to NFPA Fire Protection Handbook, "When flammable and combustible liquids are stored or handled, the liquid is usually exposed to the air at some stage in the operation, except where the storage is confined to sealed containers that are not filled or opened on the premises or where handling is in closed systems and vapor losses are recovered. Even when the storage or handling is in a closed system, there is always the possibility of breaks or leaks, which permit the liquid to escape. It is a good practice to eliminate sources of ignition in places where low flashpoint flammable liquids are stored, handled, or used, even though no vapor may ordinarily be present."

- OSHA Flammable and Combustible Liquids regulation, 29 CFR Parts 1910.106(b) on tank storage, paragraph 1910.106(b)(6) states that precaution shall be taken to eliminate or control sources of ignitions including frictional heat and mechanical sparks to prevent the ignition of flammable vapors.

- NFPA 921, Guide for Fire and Explosion Investigations 2008 Edition, Chapter 5 Basic Fire Science Table 5.7.1.1 Reported Burning and Sparking Temperature of Selected Ignition Sources under Mechanical Sparks lists a Steel tool temperature at 2550°F. When working with flammable gases, liquids or vapors, a potential hazard arises because of the possibility that sparks produced by steel or iron tools can become an ignition source.

- Recognizing the potential for steel tools to be an ignition source in flammable environment, the Occupational Safety & Health Administration (OSHA) provides guidance in booklet 3080 Hand and Power Tools, 2002 revised, "iron and steel hand tools may produce sparks that can be an ignition source around flammable substances. Where this hazard exists, spark-resistant tools should be used."

- In OSHA regulation 29 CFR 1910.146 Permit-Required Confined Spaces, Appendix D Confined Space Pre-Entry Check List, non-sparking tool is listed as one type of entry equipment. OSHA 29 CFR 1910.146 Standard Interpretations, Interpretative guidance and equipment approved for hazardous locations relative to the Permit-Required
Confined Spaces states that “…the standard does not prohibit entry into a permit space where a hazardous flammable atmosphere is at or above the 10% LFL. For concentrations at or above 10% LFL, paragraph (d) would require the employer to incorporate safe work procedures to address the flammable/explosive hazard (such as equipment approved for hazardous locations) in the entry plan for those spaces. Electrical equipment as well as other sources of ignition (non-sparking hand tools) must be considered and addressed for the hazardous atmosphere.”

- U.S. Environmental Protection Agency (EPA) has identified hazardous wastes from industry specific sources known as the K-List. Under petroleum refining section, used hydrotreating catalyst (K171) and used hydrotreating catalysts from petroleum refining operations (K172) are identified as ignitable hazardous wastes. EPA also identifies solvents such as xylene, acetone, ethyl acetate, ethyl benzene and ethyl ether commonly used in all industries (the F-list) and discarded commercial chemical products such as acetone, benzene, ethyl ether and xylene (the P-list and U-list) as ignitable hazardous wastes. OSHA regulation 29 CFR Parts 1910.120, Hazardous waste operations and emergency response, paragraph 1910.120(j)(2)(v) requires that “When there is a reasonable possibility of flammable atmospheres being present, material handling equipment and hand tools shall be of the type to prevent sources of ignition.

- Even API members such as ExxonMobil and Chevron as well as others in the petroleum industry such as Valero, CITGO Petroleum Corporation, Chem-Supply, Pty Ltd, Irving Oil Ltd, Petrol Star Inc, Nova Chemicals and El Paso Corporation list “non-sparking” tools under Accidental Release Measures and Handling and Storage sections in the MSDS’s for their petroleum products. These companies clearly recognize the need for “non-sparking” tools in working with and around flammable materials.

Clearly, API 2214 conflicts with OSHA regulations, Accredited Standards Developer’s standards and safe work practices.

2. The Committee stated that “the Committee is not aware of any pattern of fire incidents that can be linked to the use of ferrous tools. This is anecdotal information that does not indicate a significant fire hazard pattern.”

The Report of the BP U.S. Refineries independent Safety Review Panel, also known as the Baker Panel Report, states that “Preventing process accidents requires vigilance. The passing of time without a process accident is not necessarily an indicator that all is well and may contribute to a dangerous and growing sense of complacency.” Listed below are accidents caused by sparks from metal tools demonstrating that ferrous tools can be an ignition source in flammable environments.

- OSHA inspection # 300965795, an employee in the process of cleaning loose material from drill piping with a metal hammer. While striking the pipe with a hammer, an explosion occurred. Employee was killed in the explosion on site.

- OSHA inspection # 2272953, two employees were assigned the job of tending a 100 gallon (water jacket) reactor kettle of methyl methacrylate in the mixing room. Employee #1 used a metal wrench (vise-grips) to pry open the cover of a kettle. The wrench handle struck the angle iron support for the agitator motor, producing a spark. Employee #2 noticed the spark, which was immediately followed by a massive “fire ball”. Both employees were engulfed in the fireball. Employee #3 came to the area to assist the other employees. The investigation states that non-sparking tools were not provided for the employees. All three employees received first and second degree burns on their face, arms and abdomen. Employee #2 also received some third degree burns. All three employees were hospitalized.

- OSHA inspection # 124728437, Employee #1 and a coworker, both maintenance mechanics, were working in a 30 inch by 36 inch manhole at a gas station. Employee #1 was trying to change a fuel pump, while the coworker watched from outside the manhole. Employee #1 was using an Allen wrench to loosen the bolts on the fuel pump lead when he created a spark that ignited the gas fumes in the manhole, causing an explosion. Employee #1 suffered burns to his face, hands, arms and legs in the explosion and was hospitalized.

- OSHA inspection # 111109237, Employee #1 or #3 attempted to cut a metal pipe with a metal saw while Employee #2 was standing on top of one of two 5,000 gallon gas tanks, trying to remove a tank fitting. Sparks from the saw, the pipe wrench, or another unknown source ignited the gas vapors, which exploded. Employees #1 and #3 were killed of burns at the scene. Employee #2 died at the burn center as a result of burns sustained in the explosion.

- OSHA inspection #102826425, Employee #1 worked for a company that cleans paints and replaces valves in LP and MAPP gas cylinders. Before removing an old valve, Employee #1 would open the valve to let the residual gas leak out on the loading dock. Where there was a large quantity of cylinders, Employee #1 would invert the cylinder so the residual gas could vent faster. Employee #1 had an accumulation of a gas and air mixture around his work area. The vapors were ignited either by a spark from the metal screwdriver he was using to open a damaged valve or by an open flame burner approximately 40 feet away. There was a fire and explosion. The employee sustained 2nd and 3rd degree burns on the lower half of his body and was hospitalized.

- OSHA inspection # 607366, an employee was sawing an airplane wing into sections with a portable powered hand saw, the saw created a spark that caused an explosion of gasoline vapors in the wing fuel tank. Employee #1 killed and Employee #2 injured in explosion and was hospitalized.

These examples of OSHA documented accidents illustrates that accidents do happen when proper safety measures are
not taken against mechanical sparks from steel tools as a possible ignition source. We are not equipped to show specific fire hazard patterns but would welcome any resources the Committee is aware of that are publicly available. However, the Deputy Assistant Secretary of OSHA stated to Congress in June, 2010 that “Conventional injury and illness rates are not adequate indicators of the risk of fires, explosions, or other catastrophic accidents, and companies need to develop better leading indicators to assess risks in their workplaces”.

3. The Committee reiterates the statement that the US Department of Transportation’s Emergency Response Guide (ERG) “requires” the use of non-sparking tools and that the ERG is a guide, not a mandatory document.

However, OSHA regulation 29 CFR 1910.120(q)(6)(i)(E) and EPA regulation 40 CFR 311 both recognizes the value of the ERG by requiring responders to be trained regarding its use. The ERG specifies the use of “non-sparking tools” to handle spills or leaks for flammable liquids in Guide 127 Flammable Liquids (Polar/Water-Miscible), Guide 128 Flammable Liquids (Non-Polar/Water-Immiscible), Guide 129 Flammable Liquids (Polar/Water-Miscible/Noxious), Guide 130 Flammable Liquids (Non-Polar/Water-Immiscible/Noxious), Guide 131 Flammable Liquids – Toxic, Guide 132 Flammable Liquids - Corrosive

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Committee Meeting Action: Reject
Committee Statement: Paragraph 29.3.1.8 prohibits mechanical work during cargo transfer, i.e. when the hazard of the presence of vapors would exist, unless a special review has been conducted to ensure safety. If the use of hand tools is deemed necessary, this review is expected to include whether the use of spark resistant tools is appropriate. See also Comments 30-5 (Log #3), 30-9 (Log #4), and 30-16 (Log #CC1).