MEMORANDUM

TO: Technical Committee on Solvent Extraction Plants
FROM: R. P. Benedetti
DATE: June 15, 2011
SUBJECT: Agenda for Web Conference ROP Meeting – June 17, 2011

Gentlemen:

Attached is the Agenda for the web conference for the Report on Proposals (ROP) meeting of the Technical Committee on Solvent Extraction Plants, to be held Friday, June 17, 2011, beginning at 10:30 AM Eastern Time.

If you have additional items for the Agenda, they can be brought up under the New Business portion of the Agenda.

rpb/

cc SOL Meeting Folder
SOL/NM
AGENDA
Technical Committee on Solvent Extraction Plants
Web Conference
Friday, June 17, 2011, 10:30 AM Eastern Time

1. Call to Order.
2. Introduction of Participants.  Update of Committee Roster.  [Attachment № A1]
3. Approval of Minutes of Last Meeting.
4. Report of Committee Chair.
5. Report of Staff Liaison.
   • Technical Committee Scope.  [Attachment № A2]
   • Technical Committee Membership Status.  [Attachment № A2]
   • Revision Schedule for Fall 2012 Cycle.  [Attachment № A3]
7. Recent Correspondence.  (NONE)
8. Other Old Business.  (NONE)
   • Minimum Design Criteria / Area of Application for Sprinklers, Foam-Water Sprinklers,
     and Deluge Systems in Section 4.8.  [Attachment № A5]
   • Provide Recommendations for Where to Use the Systems Referenced Above.

10. Schedule Next Meeting(s).
11. Adjournment.
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Date</th>
<th>Address</th>
<th>Phone/Cell</th>
<th>Fax</th>
<th>Email</th>
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</thead>
<tbody>
<tr>
<td>George E. Anderson</td>
<td>Principal</td>
<td>1/1/1981</td>
<td>Crown Iron Works Company 2500 West County Road C PO Box 1364 Minneapolis, MN 55440-1364</td>
<td>651-639-8900</td>
<td></td>
<td><a href="mailto:ganderson@crowniron.com">ganderson@crowniron.com</a></td>
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<tr>
<td>Michael Beaver</td>
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<td>Cargill, Inc. 15407 McGinty Road West Wayzata, MN 55391 Corn Refiners Association Inc.</td>
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<tr>
<td>Brian L. Eklow</td>
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<td>312-381-3967 312-735-6125</td>
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<td>Jerry G. Fawbush</td>
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<td>Fawbush Enterprises Inc. 13111 Madden Road Churubusco, IN 46723</td>
<td>260-693-3153</td>
<td></td>
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<tr>
<td>John E. Heilman</td>
<td>Principal</td>
<td>1/1/1971</td>
<td>Heilman Consulting Group 1658 Pinon Glen Circle Colorado Springs, CO 80919-4802</td>
<td>719-598-9512 719-332-5464</td>
<td></td>
<td><a href="mailto:jeheilman@q.com">jeheilman@q.com</a></td>
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<tr>
<td>Timothy G. Kemper</td>
<td>Principal</td>
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<td>770-693-0061 770-693-0071</td>
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<td><a href="mailto:tk@desmetballestra.com">tk@desmetballestra.com</a></td>
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<td>C. L. Kingsbaker, Jr.</td>
<td>Principal</td>
<td>1/1/1970</td>
<td>Ag Processing Inc. PO Box 2047 Omaha, NE 68103-2047 International Oil Mill Superintendents Assn.</td>
<td>402-492-7782 402-492-3352</td>
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<td>Jeffrey K. Rogers</td>
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<tr>
<td>Eugene F. Smith</td>
<td>U 1/1/1996</td>
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<td>Archer Daniels Midland Company</td>
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<td>Decatur, IL 62521</td>
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<tr>
<td>National Cottonseed Products Association</td>
<td>Phone/Cell: 217-451-4212</td>
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<td>Fax: 217-451-2688</td>
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<td></td>
<td>Email: <a href="mailto:gene.smith@adm.com">gene.smith@adm.com</a></td>
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<tr>
<th>David A. Toliver</th>
<th>U 7/26/2007</th>
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<tr>
<td>Principal</td>
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<tr>
<td>Bunge North America</td>
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<tr>
<td>11720 Borman Drive</td>
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<tr>
<td>St. Louis, MO 63146</td>
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<tr>
<td>National Oilseed Processors Association</td>
<td>Phone/Cell: 314-292-2872</td>
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<tr>
<td>Alternate: Douglas D. VanMeter</td>
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<tr>
<th>Douglas D. VanMeter</th>
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<tr>
<td>Alternate</td>
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<tr>
<td>Consolidated Grain &amp; Barge Company</td>
<td>Phone/Cell: 812-833-3256</td>
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<tr>
<td>PO Box 2781, Bluff Road</td>
<td>Fax: 812-833-3260</td>
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<td>Email: <a href="mailto:douglas.vanmeter@cgb.com">douglas.vanmeter@cgb.com</a></td>
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<tr>
<th>Robert P. Benedetti</th>
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<tr>
<td>Staff Liaison</td>
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<tr>
<td>National Fire Protection Association</td>
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<td>617-571-8494</td>
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<tr>
<td>1 Batterymarch Park</td>
<td>Fax: 617-984-7110</td>
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<tr>
<td>Quincy, MA 02169-7471</td>
<td>Email: <a href="mailto:bbenedetti@nfpa.org">bbenedetti@nfpa.org</a></td>
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TECHNICAL COMMITTEE ON
SOLVENT EXTRACTION PLANTS

SCOPE STATEMENT

This Committee shall have primary responsibility for documents on safeguarding against the fire and explosion hazards associated with the design, construction, and operation of solvent extraction plants.

Responsible for NFPA 36, Standard for Solvent Extraction Plants.

COMMITTEE MEMBERSHIP BALANCE

Members: 11
Voting Alternates: 0
Alternates: 1
Non-Voting: 0
Emeritus: 0
Task Group: 0
Hold List: 2

M: 2 (18%)  U: 4 (36%)
I/M: 0  L/C: 0
R/T: 0  E: 0
I: 2 (18%)  SE: 3 (28%)

Balance: Users overbalanced
# 2012 FALL REVISION CYCLE

## Process Stage

**PRELIMINARY**

<table>
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<tr>
<th>PROCESS STEP</th>
<th>DATES FOR TC</th>
<th>DATES FOR TCC</th>
<th>COMPLETION DATE</th>
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## Report on Proposals (ROP)

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<td>2.3 Final date for mailing TC ballots</td>
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<td>8/19/11</td>
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<td>2.6 Final date for TCC meeting</td>
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<td>2.7 Final date for mailing TCC ballots</td>
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<td>2.8 Receipt of TCC ballots</td>
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<td>2.9 Receipt of TCC recirculation ballots</td>
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<td>2.10 Final copy (w/ ballot statements) to Secretary, Standards Council</td>
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## Report on Comments (ROC)

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<td>3.10 Final copy (w/ ballot statements) to Secretary, Standards Council</td>
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## Tech Session Preparation & Issuance of Consent Documents

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<td>4.3 Appeal Closing Date for Consent Documents</td>
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## Technical Session

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<td>5.0 Association Meeting for Documents with Certified Amending Motions</td>
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## Appeals & Issuance of Documents W/ CAMS

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<td>6.2 Council issuance for Documents with Certified Amending Motions</td>
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* Proposal Closing Dates may vary according to documents and schedules for Revision Cycles may change. Please check the NFPA website (www.nfpa.org) for the most up-to-date information on proposal closing dates and schedules.
### Technical Committee on Solvent Extraction Plants

**Recommendation:** Review entire document to: 1) Update any extracted material by preparing separate proposals to do so, and 2) review and update references to other organizations documents, by preparing proposal(s) as required.

**Substantiation:** To conform to the NFPA Regulations Governing Committee Projects.
Any spills of oil, solvent, or deposits of solvent-bearing material shall be cleaned up immediately and removed to a safe place. Use clean spark resistant tools to collect absorbed materials.

**Substantiation:** Ignition Hazard of Mechanical Spark from Ferrous Hand Tools:

- Mechanical sparks include impact sparks and friction sparks. Friction sparks are generated from rubbing or surface contact between ferrous or steel and other materials. Hand tools such as pliers, screwdrivers, wrenches, and sockets are used in a torque application, i.e., tools will make contact in a rubbing action. This occurs when the metal parts of the ferrous tool rub against another hard surface such as metal parts of machinery in extraction and meal processing. Impact sparks, however, are created by a ferrous or steel object being struck or dropped on another hard surface.
- Working with Modern Hydrocarbon and Oxygenated Solvents: A Guide to Flammability by American Chemistry Council, Section 2.1.4 Minimum Ignition Energy states that “Whatever the potential source of ignition, it must deliver a certain minimum amount of energy to initiate a flame front in the fuel/air mixture. However, very low energy levels can be sufficient to ignite solvent vapor/air mixtures (~0.01 – 2.0 milli joules). A spark from a metal tool falling on the floor...may have sufficient energy to ignite a fire if the solvent vapors in air are within the flammable range.”
- NFPA 36, Annex B, paragraph B.2 states that “The primary solvents used for the extraction of vegetable oils are the petroleum hydrocarbon fractions sold commercially as “hexane” and “isohexane.” NFPA 53 Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres, 2011 edition, Table F.2.1 Ignition and Flammability Properties of Combustible Liquids and Gases in Air and Oxygen at Atmospheric Pressure lists properties for various flammable liquids. Hexane’s synonyms is n-Hexane, minimum ignition temperature (MIT) for n-Hexane is 437°F (225°C) and minimum ignition energy (MIE) for n-Hexane is 0.288 milli joules (mJ). To avoid ignition, spark resistant tools are used to collect solvent absorbed material.

**Studies & data referencing Mechanical Sparks and their Hazards:**

- Martin Sheldon reported in his study, Frictional Sparking, that “It is well known that the sharpening of steel tools on a grindstone is accompanied by showers of sparks.” Sheldon went on to say “frictional heating and spark occurs when two solid bodies come into contact with each other, because of microscopic surface irregularities, they do not touch over the whole of their surfaces but only at a relative few spots. At the actual contact spots adhesion occurs between the two bodies and if they are moved relative to each other the work necessary to overcome this adhesion is converted into heat, raising the temperature of the bodies...As the contact spots are forced apart fragments of the materials may be broken off and projected into the surroundings...These small particles of material have arisen from the areas where work was expended. If these particles are heated sufficiently the glowing particles will appear as frictional sparks.”
- Martin Sheldon reported that steel friction sparks are incandescent particles at temperatures around 2732°F (1500°C).
- NFPA 921, Guide for Fire and Explosion Investigations 2011 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 spark temperature at 2550°F (1400°C).
- Therefore, the temperature of ferrous or steel tool sparks far exceeds the minimum ignition temperature of hexane solvent which means that when the atmosphere is flammable, a ferrous or steel tool spark is capable of igniting solvents.
- A test conducted by W. Bartknecht, Ignition Capability of Hot Surfaces and Mechanically Generated Sparks in Flammable Gas and Dust/Air Mixtures showed that if steel is rubbed against steel for a longer duration, (0.5-2.0 seconds) then friction sparks are generated. At ignition temperature 400°C, the electrical equivalent energy by steel friction sparks range from 10 mJ to 100 mJ.
- Friction from continuous or intermittent contact between ferrous and other materials giving a rubbing action can produce sparks that are capable of igniting hexane solvents in flammable atmospheres.
- Martin Sheldon further stated that “A one kilogram hammer falling one meter onto the ground releases about 10 joules (10000 mJ) of thermal energy”. This far exceeds MIE of hexane or n-Hexane cited above.
- Kinetic energy can be calculated as \( E_k = \frac{1}{2}mV^2 \), \( m \) is the mass in kilograms, \( V \) is velocity in meter per second (m/s), \( E_k \) is the kinetic energy in joules. Hand tools use is frequently a high velocity application. In Eckhoff’s test study, Initiation of Grain Dust Explosions by Heat Generated during Single Impact between Solid Bodies, he used a range of 10m/s to 25m/s. Based on assumptions of a 3 pound hammer with an impact velocity of 18m/s, calculated kinetic energy is 220 joules (220000 mJ). Another example, a 5 pound hammer with an impact velocity of 14m/s, calculated kinetic
energy is 235 joules (235000 mJ).

- Therefore, power density of mechanical sparks and hot surfaces from ferrous hand tools can have enough energy to ignite hexane solvents in flammable atmospheres.
- NFPA 30, Flammable and Combustible Liquids, Chapter 6, section 6.5.1 lists frictional heat or sparks as sources of ignition of flammable vapors and precaution shall be taken to control ignition sources.
- OSHA Flammable and Combustible Liquids regulation, 29 CFR Parts 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.

- Emergency Response Guidebook (ERG) requires the use of “non-sparking” tools to handle spills or leaks for flammable liquids – Guide 128 Flammable Liquids (Non-Polar/Water-Immiscible) for hexanes.
- Manufacturers of solvents regularly require the use of “non-sparking” tools under Accidental Release Measures and/or Handling and Storage sections in the MSDS’s for their products. A few examples: ExxonMobil Chemical, CITGO, Airgas, J.T. Baker, and Mallinckrodt Baker.

- Example of accidents caused by mechanical sparks from ferrous tools:
  - Friction spark from steel on steel: OSHA inspection #124728437, employee #1 and a coworker, both maintenance mechanics, were working in a 30 in. by 36 in. manhole at a Space Age Fuel gas station in Gresham, OR. 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 apparently 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. He was transported to hospital for treatment.
  - Friction spark from steel on steel: OSHA inspection #15050487, a piece of tramp metal was accidently dumped into the south side hopper along with a load of wood chips and plywood trimmings. The movement of the screens caused a spark to occur. This spark ignited the dust in the confined area of the large and open-spaced dump house.
  - Friction spark from steel on steel: OSHA inspection #126764497, employee #1 was performing maintenance work on equipment used to make ignition caps for automotive air bags. He ran into some problems and called maintenance, but instead of waiting for them to arrive, he dismantled and attempted to reassemble the parts. In the process, he put in a part upside down. The part had four screws, and while two of them were still able to be installed, the other two no longer matched with their holes. Unaware that the part was upside down, Employee #1 tried to force one of the screws in at an angle. The friction resulting from this effort ignited the cap’s residual explosive material. Flames flashed up the sleeve of Employee #1’s smock and he sustained third-degree burns to his arm.
  - Friction spark from a hand tool: Listed as accident #82 on dust incident data compiled by the Chemical Safety Board (CSB), an explosion resulted as a spark created by a worker with an Allen wrench who was turning a screw to adjust a machine. The spark ignited some propellant dust and a vacuum system carried the fire another room where a barrel of dust exploded.
  - Impact spark from metal on metal: OSHA inspection #119775823, employee #1 was working on a solvent recovery system to recycle solvent generated from a Flexographic printing process. As the spent solvent was poured into the system, sludge started to rise and a cloud of white smoke began to form. In closing the machine, the lid hit against the metal surface and generated a spark that ignited the solvent vapors. Employee #1’s sustained second-degree burns to his upper right arm.
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  - Impact spark from a metal hand tool: 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.

These examples of OSHA documented accidents illustrate that accidents do happen when proper safety measures are not taken against mechanical sparks from ferrous tools as a possible ignition source.

Safe operating practices should include protective tools. As such, mechanical sparks from ferrous tools should not be overlooked as an ignition source in restricted and controlled areas where plant is operating or not purged. Without added text, ferrous tools are likely to be used which can be an ignition source in flammable environments expose employees to an explosion and fire hazard. However, if upon further consideration, the Committee still does not see the need for restricting ferrous tools in flammable environments, 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 flammable environments.

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

 NFPA 36

Submitter: Mindy Wang, Ampco Safety Tools
Recommendation: Revise text to read as follows:

4.11.1 Power and Hand Tools. Maintenance operations involving the use of power and ferrous hand tools that can produce sources of ignition shall be prohibited except as provided for in Sections 6.7 and 6.8.

Substantiation: Ignition Hazard of Mechanical Spark from Ferrous Hand Tools:
- Mechanical sparks include impact sparks and friction sparks. Friction sparks are generated from rubbing or surface contact between ferrous steel and other materials. Hand tools such as pliers, screwdrivers, wrenches, and sockets are used in a torque application, i.e. tools will make contact in a rubbing action. This occurs when the metal parts of the ferrous tool rub against another hard surface such as metal parts of machinery in extraction and meal processing. Impact sparks, however, are created by a ferrous or steel object being struck or dropped on another hard surface.
- Working with Modern Hydrocarbon and Oxygenated Solvents: A Guide to Flammability by American Chemistry Council, Section 2.1.4 Minimum Ignition Energy states that "Whatever the potential source of ignition, it must deliver a certain minimum amount of energy to initiate a flame front in the fuel/air mixture. However, very low energy levels can be sufficient to ignite solvent vapor/air mixtures (~0.01 – 2.0 milli joules). A spark from a metal tool falling on the floor……may have sufficient energy to ignite a fire if the solvent vapors in air are within the flammable range."
- NFPA 36, Annex B, paragraph B.2 states that "The primary solvents used for the extraction of vegetable oils are the petroleum hydrocarbon fractions sold commercially as "hexane" and "isohexane.” NFPA 53 Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres, 2011 edition, Table F.2.1 Ignition and Flammability Properties of Combustible Liquids and Gases in Air and Oxygen at Atmospheric Pressure lists properties for various flammable liquids. Hexane's synonyms is n-Hexane, minimum ignition temperature (MIT) for n-Hexane is 437°F (225°C) and minimum ignition energy (MIE) for n-Hexane is 0.288 milli joules (mJ).
- Non-ferrous tools are used to guard against mechanical sparks.

Studies & data referencing Mechanical Sparks and their Hazards:
- Martin Sheldon reported in his study, Frictional Sparking, that "It is well known that the sharpening of steel tools on a grindstone is accompanied by showers of sparks.” Sheldon went on to say “frictional heating and spark occurs when two solid bodies come into contact with each other, because of microscopic surface irregularities, they do not touch over the whole of their surfaces but only at a relative few spots. At the actual contact spots adhesion occurs between the two bodies and if they are moved relative to each other the work necessary to overcome this adhesion is converted into heat, raising the temperature of the bodies….As the contact spots are forced apart fragments of the materials may be broken off and projected into the surroundings….These small particles of material have arisen from the areas where work was expended. If these particles are heated sufficiently the glowing particles will appear as frictional sparks.”
- Martin Sheldon reported that steel friction sparks are incandescent particles at temperatures around 2732°F (1500°C).
- NFPA 921, Guide for Fire and Explosion Investigations 2011 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 spark temperature at 2550°F (1400°C).
- Therefore, the temperature of ferrous or steel tool sparks far exceeds the minimum ignition temperature of hexane solvent which means that when the atmosphere is flammable, a ferrous or steel tool spark is capable of igniting solvents.
- A test conducted by W. Bartknecht, Ignition Capability of Hot Surfaces and Mechanically Generated Sparks in Flammable Gas and Dust/Air Mixtures showed that if steel is rubbed against steel for a longer duration, (0.5-2.0 seconds) then friction sparks are generated. At ignition temperature 400°C, the electrical equivalent energy by steel friction sparks range from 10 mJ to 100 mJ.
- Friction from continuous or intermittent contact between ferrous and other materials giving a rubbing action can produce sparks that are capable of igniting hexane solvents in flammable atmospheres.
- Martin Sheldon further stated that “A one kilogram hammer falling one meter onto the ground releases about 10 joules (10000 mJ) of thermal energy”. This far exceeds MIE of hexane or n-Hexane cited above.
- Kinetic energy can be calculated as Ek=½mV², m is the mass in kilograms, V is velocity in meter per second (m/s), Ek is the kinetic energy in joules. Hand tools use is frequently a high velocity application. In Eckhoff's test study, Initiation of Grain Dust Explosions by Heat Generated during Single Impact between Solid Bodies, he used a range of 10m/s to 25m/s. Based on assumptions of a 3 pound hammer with an impact velocity of 18m/s, calculated kinetic energy is 220 joules (220000 mJ). Another example, a 5 pound hammer with an impact velocity of 14m/s, calculated kinetic
NFPA 36

OSHA inspection #2272953, two employees were assigned the job of tending OSHA inspection #119775823, employee #1 was working on a solvent recovery OSHA inspection #300965795, employee #1 was in the process of cleaning loose OSHA inspection #124728437, employee #1 and a coworker, both maintenance OSHA inspection #126764497, employee #1 was performing maintenance work Listed as accident #82 on dust incident data compiled by the Chemical Safety Board OSHA inspection #15050487, a piece of tramp metal was accidently dumped into his upper right arm. metal surface and generated a spark that ignited the solvent vapors. Employee #1's sustained second-degree burns to Airgas, J.T. Baker, and Mallinckrodt Baker, or Handling and Storage sections in the MSDS's for their products. A few examples: ExxonMobil Chemical, CITGO, Airgas, J.T. Baker, and Mallinckrodt Baker,

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

Printed on 6/15/2011
6.4.2 Where fabric filters are used for the collection of dust they shall be located (either) outside of the building (or along an outside wall in a fire-resistive room inside the building) (or shall comply with one of the exceptions listed below.)

Exception No. 1:
Dust collectors shall be permitted inside of buildings if located as close as practical to an exterior wall, vented to the outside through straight ducts not exceeding 6 m (20 ft) in length, and designed so that the explosion pressures will not rupture the ductwork or the collector.

Exception No. 2:
Dust collectors shall be permitted to be located inside of buildings if equipped with an explosion suppression system designed according to NFPA 69, Standard on Explosion Prevention Systems.

Exception No. 3:
Centrifugal separators, without bags, used for removing moisture from coolers that handle pelleted, extruded, or flaked grain and feed products shall be permitted inside or outside of buildings without explosion protection.

Exception No. 4:
Bin vent dust collectors directly mounted without a hopper on a tank or bin, whose primary function is to filter air displaced during filling or blending operations and return dust directly to the bin, shall be permitted inside or outside of buildings without explosion protection. Filters that return air to inside of buildings shall be capable of a minimum efficiency of 99.9 percent at 10 microns.

Exception No. 5:
Filters used for classifying food products with air (product purifiers) shall be permitted to be located inside or outside of buildings without explosion protection.

Substantiation: The current NFPA 36 Standard is not aligned with the NFPA 61 Standard. The exceptions added by this proposal are directly from NFPA 61 10.4.3 2008. Since Grain Elevators are located at the same site as Solvent Extraction Plants lack of alignment of NFPA 36 and NFPA 61 causes confusion for installation and protection of dust collection equipment.

Acceptance of this proposal aligns NFPA 36 with NFPA 61 and offer practical options for installation and protection of filter collectors.
James E. Norris, Bunge

Recommendation: Delete text to read as follows:

(6.4.2.1 The inside wall of an inside room shall be explosion resistant.)

Substantiation: The current NFPA 36 Standard is not aligned with the NFPA 61 Standard. Inclusion of my proposal to modify 6.4.2 is inclusive of NFPA 61 Exceptions and eliminates the need for this requirement. Since Grain Elevators are located at the same site as Solvent Extraction Plants lack of alignment of NFPA 36 and NFPA 61 causes confusion for installation and protection of dust collection equipment.

Acceptance of this proposal aligns NFPA 36 with NFPA 61 and offers practical options for installation and protection of filter collectors.
6.4.2.2 The outside walls of roof of an inside room shall have explosion relief in the ratio of 1 m² of relief area for each 9 m³ to 15 m³ of room volume (1 ft² of relief area for each 30 ft³ to 50 ft³).

Substantiation: The current NFPA 36 Standard is not aligned with the NFPA 61 Standard. Inclusion of my proposal to modify 6.4.2 is inclusive of NFPA 61 Exceptions and eliminates the need for this requirement. Since Grain Elevators are located at the same site as Solvent Extraction Plants lack of alignment of NFPA 36 and NFPA 61 causes confusion for installation and protection of dust collection equipment.

Acceptance of this proposal aligns NFPA 36 with NFPA 61 and offer practical options for installation and protection of filter collectors.
6.4.3 [Automatic sprinklers shall be installed within fabric-type dust collector housings.] Equipment requiring explosion prevention shall be protected by containment, suppression, inerting, or explosion venting.

6.4.3.1 Suppression, containment, or inerting systems shall be designed according to NFPA 69, Standard on Explosion Prevention Systems.

6.4.3.2 Venting shall be directed to a safe, outside location away from platforms, means of egress, or other potentially occupied areas or directed through a listed flame arresting and particulate retention device.

Substantiation: The current NFPA 36 Standard is not aligned with the NFPA 61 Standard. My proposal to modify 6.4.3 which is inclusive of NFPA 61 protection requirements found in NFPA 61 6.3 2008. Since Grain Elevators are located at the same site as Solvent Extraction Plants lack of alignment of NFPA 36 and NFPA 61 causes confusion for installation and protection of dust collection equipment.

Acceptance of this proposal aligns NFPA 36 with NFPA 61 and offers practical options for installation and protection of filter collectors.
7.7.6 Zone 1 Locations. Electrical wiring and electrical utilization equipment of the extraction process shall be installed in accordance with the requirements for Zone 1 locations as specified by NFPA 70, National Electrical Code. The Zone 1 location shall extend outward from the extraction process and into the restricted area for a horizontal distance of not less than 4.5 m (15 ft) and a vertical distance of not less than 1.5 m (5 ft) above the highest vent, vessel, or equipment containing solvent, as shown in Figure 7.7.2.

7.7.7 Electrical wiring and electrical utilization equipment within the restricted area beyond the 4.5 m (15 ft) distance specified in 7.7.2 and to a height of 2.4 m (8 ft) above the extraction process grade level shall be installed in accordance with the requirements of Zone 1 locations, as specified in NFPA 70, National Electrical Code, and as shown in Figure 7.7.2.

7.7.8 Electrical wiring and electrical utilization equipment within the controlled area and to within a height of 1.2 m (4 ft) above grade level shall be installed in accordance with the requirements of Zone 1 locations, as shown in 7.7.2.

7.7.9 Permanent luminaires (lighting fixtures) shall be installed where needed.

7.7.10 Flashlights approved for Zone 1, Group IIA locations shall be provided.

7.9.6 Power transmission belts shall not be used in any area that is classified as a Zone 1 or Zone 2 location as shown in Figure 7.7.2.

7.9.7 Process vent fans, purge fans, and building ventilation fans that might handle solvent vapors, including any fans that have air intakes located in Zone 1 or Zone 2 locations, as shown in Figure 7.7.2, shall be of AMCA Type B spark-resistant construction or better.

Substantiation: 1. This would align NFPA 36 with last couple of NFPA 70 updates which include Zone ratings for hazardous areas.

2. This standard is used internationally by US based corporations and many of those countries do not use the Class and Division format typically used in the US. Therefore, in order to compliment the other countries’ use of the Zone system, an alternate method of area classification is offered to harmonize international systems. This is intended to be in addition to the Class and Division systems, NOT a replacement.
Good day, Mr. Narendran:

Subsection 4.8.2 of NFPA 36, *Standard for Solvent Extraction Plants*, does require an automatic sprinkler system for the preparation building. However, it does not specify a specific density or area of application; it simply refers to NFPA 13, *Standard for the Installation of Sprinkler Systems*.

You should look for guidance to NFPA 13 for the appropriate density and area of application.

R. P. Benedetti

cc 36/IFI
SOL/NM

--------------------------

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Attend the premier event for fire, life safety, and electrical professionals!


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From: srinivasan.c@fireprosystems.com [mailto:srinivasan.c@fireprosystems.com]
Sent: Friday, May 28, 2010 12:49 AM
To: Benedetti, Bob
Subject: Information on Vegetable Oil Extraction Plant

Dear Sir,

Membership ID No. - 102145
Name - PV Narendran
Company - Firepro Systems Pvt. Ltd.
Address - Firepro House, 10 & 11, Service Road, HAL 2nd Stage, Indiranagar, Bangalore - 560 008, Karnataka, India
Email id - pvn@fireprosystems.com
We have working on an Oil Seed Processing Plant where Oil (Vegetable/Edible Oil) is extracted from seeds like Canola, Safflower for which we need to provide Fire Protection Systems.

There are these following major buildings

1. Seed Preparation Plant (SPP) or Crushing unit with 6 floors
2. Solvent Extraction Plant (SEP) with 7 floors
3. Refinery Building with 8 floors

- NFPA 36 proposes automatic sprinklers for Seed Preparation Area, what occupancy hazard does this fall under and what's is the design density we need to consider. Does the design density remain the same for all floors
- Similarly what is the design density we need to consider for Solvent Extraction Plant and Refinery Building and does it vary on each floors.

Would appreciate your early response.

Regards,

PV Narendran
Centre of Excellence (COE)
Firepro Systems Pvt. Ltd.

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