WORK PERMIT SYSTEM

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WORK PERMIT SYSTEM

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Preamble

Indian petroleum industry is the energy lifeline of the nation and its continuous performance is essential for sovereignty and prosperity of the country. As the industry essentially deals with inherently flammable substances throughout its value chain – upstream, midstream and downstream – Safety is of paramount importance to this industry as only safe performance at all times can ensure optimum ROI of these national assets and resources including sustainability.

While statutory organizations were in place all along to oversee safety aspects of Indian petroleum industry, Oil Industry Safety Directorate (OISD) was set up in 1986 Ministry of Petroleum and Natural Gas, Government of India as a knowledge centre for formulation of constantly updated world-scale standards for design, layout and operation of various equipment, facility and activities involved in this industry. Moreover, OISD was also given responsibility of monitoring implementation status of these standards through safety audits.

In more than 25 years of its existence, OISD has developed a rigorous, multi-layer, iterative and participative process of development of standards – starting with research by in-house experts and iterating through seeking & validating inputs from all stakeholders – operators, designers, national level knowledge authorities and public at large – with a feedback loop of constant updation based on ground level experience obtained through audits, incident analysis and environment scanning.

The participative process followed in standard formulation has resulted in excellent level of compliance by the industry culminating in a safer environment in the industry. OISD – except in the Upstream Petroleum Sector – is still a regulatory (and not a statutory) body but that has not affected implementation of the OISD standards. It also goes to prove the old adage that self-regulation is the best regulation. The quality and relevance of OISD standards had been further endorsed by their adoption in various statutory rules of the land.

Petroleum industry in India is significantly globalized at present in terms of technology content requiring its operation to keep pace with the relevant world scale standards & practices. This matches the OISD philosophy of continuous improvement keeping pace with the global developments in its target environment. To this end, OISD keeps track of changes through participation as member in large number of International and national level Knowledge Organizations – both in the field of standard development and implementation & monitoring in addition to updation of internal knowledge base through continuous research and application surveillance, thereby ensuring that this OISD Standard, along with all other extant ones, remains relevant, updated and effective on a real time basis in the applicable areas.

Together we strive to achieve NIL incidents in the entire Hydrocarbon Value Chain. This, besides other issues, calls for total engagement from all levels of the stake holder organizations, which we, at OISD, fervently look forward to.

Jai Hind!!!

Executive Director

Oil Industry Safety Directorate
FOREWORD

Oil Industry in India is over 100 years old. As such variety of practices have been in vogue because of collaboration / association with different foreign companies and governments. Standardization in design philosophies and operating & maintenance practices at national level was hardly in existence. This, coupled with feed back from some serious accidents that occurred in the recent past in India and abroad, emphasised the need for the industry to review the existing state-of-art in designing, operating and maintaining oil and gas installations.

With this in view, the Ministry of Petroleum and Natural Gas in 1986 constituted a Safety Council assisted by the Oil Industry Safety Directorate (OISD), staffed from with in the industry, formulating and implementing a series of self regulatory measures aimed at removing obsolescence, standardising and upgrading the existing standards to ensure safer operations. Accordingly, OISD constituted number of functional committees comprising experts nominated from the industry to draw up standards and guidelines on various subjects.

The first document on "Work Permit System" was published by OISD in February 1988 and was amended in July 1998. The present document on “Work Permit System” is the first revision of this OISD Standard.

Attempts have been made to incorporate the latest technological changes, experience gained after the implementation of standards and relevant updation in the various national and international codes and practices.

It is hoped that the provision of this document, if implemented objectively, will go a long way in improving the safety in oil and gas industry.

This document will be reviewed periodically for improvements based on the experience and better understanding. Suggestions from industry members may be addressed to:

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These documents are intended to supplement rather than replace the prevailing statutory requirements.
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First Edition – February 1988

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In addition to the above, several other experts from the industry contributed in the preparation, review and finalization of this document.
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*Specimen Formats of Work Permit*

- **Annexure-I**  
  Cold Work Permit  
  \[9\]

- **Annexure-II**  
  Hot Work / Confined Space Entry Permit  
  \[12\]

- **Annexure-III**  
  Electrical Isolation / Energisation Permit.  
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WORK PERMIT SYSTEM

1.0 INTRODUCTION

Working in hydrocarbon processing / handling installation presents special risk and in order to provide safe working conditions and to carry out the work safely, a work permit system shall be followed. The basic purpose of the work permit system is to ensure that work is carried out in the safest possible manner to prevent injuries to personnel, protect property from damage, avoid fire etc.

2.0 SCOPE

This standard shall be applicable to all hydrocarbon processing / handling installations such as onshore / offshore oil and gas processing plants & platforms, drilling and workover rigs, crude oil and product installations, refineries, oil port terminals, pipelines & pipeline installations, marketing installations, LPG bottling plants, Lube Blending plants etc.

3.0 DEFINITIONS

a) **Cold Work**: An activity which does not produce sufficient heat to ignite a flammable air - hydrocarbon mixture or a flammable substance.

b) **Confined space**: It is an enclosure with known or potential hazards and restricted means of entrance and exit, is not normally occupied by people, and is usually not well ventilated.

c) **Exposure Limit**: Measure of the maximum airborne concentration limit for toxic substances to which person may be exposed without protection (for example, respirator). Exposure limits are usually expressed as parts per millions or milligrams per cubic meter.

d) **Hot Work**: An activity that can produce a spark or flame or other source of ignition having sufficient energy to cause ignition, where the potential for flammable vapors, gases, or dust exists.

e) **Issuer**: Designated person authorized to issue work permit.

f) **Lower Flammable Limit (LFL)**: Is the minimum concentration of a vapor in air (or other oxidant) below which propagation of flame does not occur on contact with an ignition source. This is usually expressed as volume percentage of the vapor in air. This is also referred as Lower Explosive Limit (LEL)

g) **May**: Indicates provisions that are optional

h) **PPE - Personal Protective Equipment**: Devices or clothing used to insulate an individual from the chemical, thermal, explosive, electric shock or other hazards presented by the environment in which one is working. Some of PPEs are Safety goggles, Apron, Safety shoes, Chemical-resistant gloves etc.

i) **Pyrophoric substance**: Substances that ignites spontaneously in air at ambient temperature. In hydrocarbon industry iron sulfide is the most commonly observed pyrophoric substance and is called as pyrophoric iron.

j) **Receiver**: Designated person authorized to receive work permit.

k) **SCBA - Self Contained Breathing Apparatus**: It is an apparatus consisting of a suitable mask, combined with a hose and source of fresh air generally in the form of a cylinder of compressed air.

l) **Shall**: indicates provisions that are mandatory.

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m) **Should:** Indicates provisions that are recommended but not mandatory. Implementation of these provisions shall be based upon the consideration of the followings, as appropriate: (a) risk / benefit analysis, (b) company standards, (c) company experience, and (d) company philosophy.

n) **Upper Flammability Limit (UFL):** Is the maximum concentration of a vapor in air (or other oxidant) above which propagation of flame does not occur on contact with and ignition source. This is usually expressed as a volume percentage of vapors in air. This is also referred as Higher Explosive Limit (HEL)

### 4.0 TYPES OF WORK PERMITS:

Based on the nature of work to be performed, the following minimum type of work permits shall be used.

- Cold Work Permit
- Hot Work Permit
- Confined Space Entry

**Composite Permit**

- Electrical isolation and Energisation permit

Composite permit for Hot work and Entry to confined space is described at item 4.3. Integrated permit for cold / hot / entry to confined space / electrical isolation work etc may be used. However, it shall comply with all the requirements of individual permits.

#### 4.1 Cold Work Permit:

Work falling under the category of cold work such as opening process machinery, blinding & deblinding, tightening of flanges, hot bolting, inspection, painting etc. shall be performed through Cold Work Permit.

This Permit shall be in minimum two copies. The original should be in yellow colour and the copy should have the word "COPY" printed in large yellow letters. Original shall be issued to the receiver, retaining the duplicate in the book. Specimen format for the cold work permit is enclosed as Annexure-I.

#### 4.2 Hot Work Permit:

All hot work such as welding, grinding, gas cutting, burning, shot blasting, soldering, chipping, excavation, open fire, use of certain non-explosion proof equipment etc. shall be carried out through Hot Work Permit. Entry and operation of petrol or diesel driven vehicles or equipment in hazardous area also falls in the category of hot work, and shall be performed under the hot work permit.

This work permit shall be in minimum three copies. The original should be in pink colour and copies should have the word "COPY" printed in large pink letters. Original shall be issued to the receiver, duplicate to the Fire & Safety Section and triplicate retained in the book. The number of copies shall be four where Fire and Safety sections are separate.

For excavation work regardless of the depth, permission from various sections shall be obtained with precautions to be taken for the underground facilities viz; sewers, telephone lines, cables, pipelines etc. Copy of permission for excavation shall be attached to the work permit. A feedback system shall be in place to inform all the concerned department / section about the completion of work.

#### 4.3 Confined Space Entry permit:

This permit is required for the protection of personnel entering a confined space such as Vessels, boilers, storage tanks, large diameter piping etc against hazards such as oxygen deficiency, toxic and flammable materials, falling objects, power driven equipment etc. Excavation more than 1.2
meter deep, entry on floating roof tanks when the roof are more than 3 meter down from the top, space located below ground level such as pits, drain channels etc. also fall under the confined space

The permit shall be in minimum three copies. The original should be in colour different than the cold and hot work permit and other copies should have the word "COPY" printed in large letters. Original copy shall be issued to the receiver, the duplicate to the Fire & Safety Section and triplicate retained in the book.

Confined Space Entry Permit shall be supplemented with hot or cold work permit as per the type / nature of work.

**Composite Permit** may be used for the various jobs such as hot work outside the confined space, entry to confined space and cold / hot work inside the confined space. The checklist of composite permit must address all the applicable aspects.

A specimen of the composite permit for "Hot work" and "Entry to Confined space" is enclosed as Annexure-II. Checklist points of the composite permit may be sectionalized under various heads as given in the specimen copy. Based on the work to be performed, relevant section checklist along with the general section shall be duly ticked.

4.4 **Electrical isolation and energisation permit:** Before issuing any work permit, it is essential that the equipment / facility to be worked on is electrically safe and electrical power is isolated to the extent necessary for the safe conduct of the authorized work.

Permit for electrical isolation and energisation shall be in triplicate and in two sections with tear off facility. Section-A shall be used for electrical isolation and Section-B for energisation.

The original should be in color different than the other permits and copies should have the word "COPY" printed in large letters. Original along with a copy shall be issued to the electrical section for electrical isolation / energisation. Electrical section authorized person on isolation / energisation of the equipment / circuit shall return the original to the issuer keeping copy for record. Specimen format for the Electrical isolation / energisation is enclosed at Annexure-III.

For details refer OISD-STD-137 and IS: 5216.

5.0 **PROCEDURE FOR WORK PERMIT SYSTEM**

Following procedure shall be adopted for implementation of Work Permit System:

(a) The Work Permit System shall always operate on "Owner - In-charge" concept. (Example: Process Unit - Shift In-charge; Laboratory - Chief Chemist; Depot - Depot In-charge; Installation - Installation Manager, Pipelines Installation- Shift In-charge etc).

The concerned management shall issue the appropriate authority levels for various installations and type of permits based on this concept.

(b) A duly authorized written permit shall be obtained for performing a work in hydrocarbon processing / handling installation by the designated person other than the operating personnel of that area for executing the work.

(c) Permits should be in printed form preferably in the form of books with tear off facility. A system of colour coding is recommended to identify the various types of permits. All permits shall be serially numbered. General instructions applicable to the type of the permit should be printed on the overleaf.

(d) The work permit shall be filled up carefully and accurately in clear writing ensuring that detailed and complete information is provided in all the sections / sub sections. Sketches
should be attached wherever possible to avoid miscommunication. Additions and alterations on the original shall also be endorsed on all the copies. The permit form shall have sufficient space (not less than two lines) against description of work to give clear and complete description of the work.

(e) Supplementary formats / checklist should be used for working at height, equipment box up, road cutting, dyke cutting etc for safe execution of the work. "Work at height shall be carried out in accordance with the provisions of OISD-STD-192. Supplementary checklist as per the checkpoints of OISD-STD-192 shall be used for working at height.

Additional checklist items / monitoring parameters / Instructions etc. may also be included in the work permit format as applicable to meet the statutory requirements. In addition to the regular work permit, supplementary permits as required by the local statutory bodies are also to be issued.

(f) No hot / cold job shall be undertaken without a work permit except in the areas pre-determined and designated by the owner-in-charge. All work permits shall be issued by the authorized person of the area where work is to be carried out. For critical and for long duration works the authorizing level should be elevated.

(g) The work may be planned to be done either departmentally or through a contractor. In either case, the work permit should be received and signed by the maintenance / project /construction supervisor of the company. In small installations where no such independent supervisor exists, the owner-in-charge may issue the permit to the contractor's authorized supervisor directly and obtain his signature.

(h) Plot plans of the installation and the operating blocks should be displayed in the Fire Station and concerned Unit Control Rooms respectively. The site of hot jobs should be indicated on these plot plans with red pins. This helps the incoming supervisor /s (both in Fire station and operating departments) to get a quick idea of the hot jobs being undertaken and help in identifying the areas which require inspection / attention, depending upon the criticality of the area and the job.

(i) The Safety Officer / Fire Officer / Officer authorized should make periodic check of the work sites and see that the work is being carried out as per conditions laid down in the work permit. At any point of time, if he considers that the conditions are not safe for the work, he may suspend the work and inform the Work Permit Issuing Authority to restore the safe conditions so that work can be restarted.

(j) Issuer should make periodic check of the work sites and see that the work is being carried out in safe manner and as per conditions laid down in the work permit. Work shall be suspended in case the conditions are not safe.

(k) Permit shall be issued only for a single shift. Where the work has to be continued, the same permit may be revalidated / extended shift wise for a period not exceeding seven calendar days in the succeeding shifts by authorized person after satisfying the permit conditions.

In instances like plant turn around, work permit of extended duration may be used with the approval of designated senior management.

(l) For construction activities to be undertaken in non-operating areas, segregated from the rest of the operating facilities and properly barricaded, Work Permit of validity not exceeding one month with periodic checks may be issued with the approval of the designated senior management.

(m) No person shall be required or allowed to enter any confined space, until all practicable measures have been taken to remove any gas, fume, vapor or dust, which may be present so
that to bring its level within the permissible limits and to prevent any ingress of such gas, fumes, vapors or dust and unless;

Entry permit in writing has been issued based on the test carried out that the space is reasonably free from dangerous gas, fume, vapor or dust

(n) Gas test for hydrocarbon, oxygen deficiency, toxic gases etc shall be conducted as applicable as a pre-requisite to issue permit for hot work / vessel entry etc,

No hot work should be permitted unless the Explosive meter reading is zero.

Vessel entry, where no hot work is to be carried out, may be permitted under extra precautionary measures based on the careful analysis of the potential hazards if combustible gases are up-to 5% of lower explosive limit (LEL). Entry with an air-supplied mask may be permitted with LEL of upto 20%. The oxygen level should be at least 19.5% vol. and the concentration of toxic gases below the threshold limits.

(o) A careful analysis should be made of the potential hazards and the operations to be performed to determine the appropriate safeguards and required personal protective equipment prior to starting work.

Where gas-free conditions are not fully ensured for the duration of hot work, a system of monitoring either by automatic or by manual periodic verification shall be resorted to depending upon the prevalent conditions of the operating area.

(p) When work requires entry to confined space, the permit system shall address both the hazards of entry and of doing work inside the confined space.

(q) While performing welding / cutting jobs in confined spaces, ensure that cylinders (oxygen, acetylene, nitrogen, argon etc) are kept outside separately and hoses for the gases are in good working condition. Flash back arrestor should be provided for cutting torch.

(r) For work in close proximity of a public road, for example in the case of a trunk pipeline, it may be desirable to block-off divert public traffic for the duration of the job as a precautionary measure.

(s) Welding machine should be located in a non-hazardous and ventilated area and shall be properly earthed. Before commencing the welding job, ensure that all the cables and earthing connections are as per the standard welding codes / practices. It should be switched off immediately on completion of the job.

(t) Radiography with X-ray machine shall be carried out under hot work permit. Cold work permit may be used if it is done with radio-active isotopes. Radiography should be carried out when occupancy is least. Based on the maximum allowable radiation, area shall be cordoned off. Adequate warning signs on the outskirt of cordoned area shall be provided. Warning lights should be used for night radiography.

(u) Work should be stopped if any unsafe condition arises during the course work.

(v) After completion or stoppage of the job, the permit shall be closed. Receiver shall satisfy himself about the completion of the job (thoroughly check the area for clearing of debris, removal of temporary electrical installations & machines etc.) before closing the permit. Similarly issuer shall satisfy himself regarding completion of the job and that the area has been cleaned before closing the permit. The permit will be treated "Closed" only after signing by Issuer and the Receiver.

(w) Copies of completed / used permits shall be properly filed and kept as records for future reference for at least Three months from the date of completion of work or the successful commissioning of the facility for which the work permit was issued which ever is later.
(x) Any person who is authorized to issue or receive the work permit shall be imparted training for a period of not less than one day covering various aspects of work permits system. Further all the person authorized to issue / receive or involved with the work permit shall be given a minimum of one day training once in two year on the work permit system and records maintained.

Since several maintenance/ construction jobs are often carried out with assistance from contractors, it is essential to provide sufficient exposure to contractor and his employees as well on the work permit system.

(y) Companies / locations shall develop work practices / procedures for the safe execution of jobs (hot work, confined space entry, vehicle entry, handling lifting equipment, radiography etc.) in accordance with the site specific facilities. The work procedure shall be approved by the owner and adopted for carrying out the work safely under work permit system.

6.0 EXPLANATORY NOTES TO WORK PERMIT FORMS

Explanatory notes to fill up the work permit and its check-listed items are elaborated below to amplify the underlying concepts and highlight their significance:

a) Exact Location (Area / Unit / Equipment no): Exact location of the area or the unit in which the work is to be carried out shall be written against it. For example, AVU / 12 C - 101, Tank farm A, Tank 501 etc.

b) Description of work: Precise description of the work to be performed shall be written. Sketches should be attached wherever possible to avoid miscommunication.

c) Equipment / Area inspected: Equipment or area where work is to be conducted, should be inspected to ensure that it is safe to carry out the work and assess other safety requirements / stipulations. In case of equipment / vessel box-up permit, it should be ensured that the work is complete, all personnel are out, no maintenance gear is left behind and debris removed.

d) Surrounding area checked / cleaned: Unsafe conditions for performance of work may arise from surrounding area. It should be cleaned-up to remove flammable material such as oil, rags, grass etc.

e) Sewers, Manholes, Closed Blow Down (CBD) etc. and Hot Surfaces covered: Flammable gases may be released from nearby sewers. Hot un-insulated surfaces (equipment / pipelines) may provide a source of ignition and therefore, these are to be properly covered to prevent fires.

f) Hazard from other routine / non-routine operations considered and persons alerted: Other activities (routine / non-routine) being carried out near-by, which can create conditions unsafe for performance of the permit work, should be taken into consideration and the concerned persons should be alerted accordingly.

g) Equipment electrically isolated and tagged: Before issuing a permit, it shall be ensured that electrical isolation has been done, switches are locked-out and cautionary tags duly signed with date and time are attached.

h) Running water hose / Portable extinguisher provided / Fire water system available: Running water hose and portable fire extinguisher are required to flush / dilute in case of release of any hazardous chemical or to quench sparks and to put out small fires immediately.

In order to meet any contingency, it should be ensured that the fire water system including firewater pumps, storage, network etc. is checked and kept ready for immediate use.

i) Equipment blinded / disconnected / closed / isolated / wedge opened: Equipment for which the work permit is being issued, should be isolated from the rest of the plant in order to
ensure that there is no change in the work environment with respect to presence of toxic / flammable gases, liquids, hazardous chemicals etc. in the course of the work.

Blinding is one of the most effective ways of isolation. Blinds should be installed as close to the equipment as possible. If lines cannot be blinded, these should be disconnected and the open ends should be made safe by installing pipe caps / plugs, blind flanges etc.

j) Equipment properly drained / depressurised: Equipment under pressure should be depressurised after isolation. This should be followed by draining / purging / water flushing etc. as the case may be.

Equipment containing liquid hydrocarbons should be drained completely. There may be a possibility of overlooking of liquid collected in pockets or inaccessible areas such as level gauges, small nozzles / bleeders on vessels, laterals in pipe work etc. All low point drains should be in unplugged condition.

k) Equipment properly steamed / purged: Purging of equipment (tanks, vessels, pipelines etc.) is done to make them free of flammable hydrocarbon and toxic gases. Steam / Inert Gas is used for gas freeing of vessels and pipes in refineries and other locations. Other means of purging is by displacement with water and final traces of gas removed by properly earthed air eductor. All high point vents should be unplugged while purging. It should be done in a systematic manner to cover the entire equipment / plant and continued till the concentration of toxic / flammable gas is lowered to allowable level.

l) Equipment water flushed: Water flushing is an effective means of cleaning, cleaning and even gas freeing of equipment. It is also employed to remove traces of acids / chemicals. Equipment metallurgy must be considered before using sea / saline water. Sometimes, flushing with demineralised water would be necessary depending upon the metallurgy of the equipment.

m) Gas / Oxygen deficiency test done: Gas test includes measurement of:
   (i) Hydrocarbons by Explosive meter
   (ii) Oxygen Deficiency by Oxygen Meter
   (iii) Toxic gases like Hydrogen Sulphide, Carbon Monoxide, Nickel Carbonyl, and Chlorine etc. by techniques like Indicator Tube method, Lead Acetate Paper etc.

Measurement of lead in air is required for entering tanks (which stored leaded gasoline earlier) and personal protective equipment shall be worn before entering the tank.

n) Shield against sparks provided: Hot works like welding, grinding etc generates sparks which can provide source of ignition to the surroundings. In order to protect operating area from the hazards of sparks generated, shields are to be provided to contain the sparks generated. The shield material should be non-flammable and should be kept wet with water.

o) Proper ventilation and lighting provided: Where natural ventilation is not available, fans / air eductors are provided. These are also required for speedy dispersal of fumes generated by welding job. Only approved reduced voltage extension lights (not exceeding 24 volts) are to be allowed for work inside vessels from consideration of personal safety.

p) Proper means of exit provided: Proper means of exit is required in case of emergencies developed on account of the work or otherwise. Availability of an alternate route of escape should be considered.

q) Area cordoned off and caution boards provided: To prevent any unwarranted entry in the work area and also to caution other personnel taking actions which may endanger people working on the permit job, precautionary tags / boards are to be provided to display like "No
Entry" sign on roads or "Caution - Men at Work Inside" on the manhole of a vessel, "Danger - Radiography in progress" etc.

r) **Portable equipment / Hose nozzles properly grounded:** As a precaution against static electricity generation, portable equipment / hose nozzles e.g. nozzle of a shot blasting gun, are to be grounded. Use of hydrocarbon lines for earthing should be avoided. 30 mili-amp circuit breaker shall be installed on electrical circuits / cables feeding power supply to portable equipment.

s) **Standby person provided for entry to confined space:** Whenever a person is entering in a confined space, minimum two designated persons shall be kept at the manhole or entry point. The designated person shall be in constant communication with the persons inside the confined space.

t) **Standby personnel provided for fire watch from Process / Maintenance / Contractor / Fire Department:** Depending on the criticality of the job, work permit issuer shall decide the type of standby to be provided i.e. from which department, of which level, how many and also additional fire fighting support facilities etc.

u) **Iron Sulphide removed / kept wet:** Pyrophoric substances may be present in operating area / equipment handling hydrocarbon. Iron Sulphide scale is the most common pyrophoric substance encountered. These should be either removed to safe locations or kept wet all the time to prevent their auto-ignition.

v) **Clearance obtained for excavation / Road cutting / dyke cutting etc:** For any excavation work which may affect underground sewers / telephone lines / cables / pipelines etc., clearance shall be obtained from all the concerned sections. Markers should be put around the area where excavation is to be done and the depth to be indicated in the work permit.

Road cutting can hamper the movement of the fire vehicles; initial clearance should be obtained from Fire Department and final approval from the higher designated authorities.

When the dyke is cut, any mishap in the tank farm can lead to a free flow of oil to outside the bund. A higher level authority should be designated for authorizing dyke cutting. Further, it should be ensured that dyke would be reconstructed in the shortest possible time.

w) **Checked spark arrestor on mobile equipment:** No vehicle / engine without spark arrestor shall be permitted in operating areas.

x) **Checked for oil / gas trapped behind lining in equipment:** Before undertaking hot jobs, a check should be done for oil / gas trapped behind lining in the equipment.

### 7.0 References:

- Work Permit systems in India and Abroad.
- API-2016, Guidelines and Procedures for entering and cleaning petroleum storage tanks.
- Loss and Prevention in Process Industry by Frank P Lees.
- API Standard 2015 - 2001 "Requirements for safe entry and cleaning of petroleum storage tanks.

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Annexure-I

COLD WORK PERMIT

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item</th>
<th>Done</th>
<th>Not Req.</th>
<th>Sr. No.</th>
<th>Item</th>
<th>Done</th>
<th>Not Req.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Equipment / Work Area inspected</td>
<td></td>
<td></td>
<td>6</td>
<td>Equipment water flushed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Surrounding area checked, cleaned and covered</td>
<td></td>
<td></td>
<td>7</td>
<td>Equipment properly steamed / purged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Equipment blinded/disconnected / closed / isolated / wedge opened</td>
<td></td>
<td></td>
<td>8</td>
<td>Proper ventilation and lighting provided</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Equipment properly drained and depressurized</td>
<td></td>
<td></td>
<td>9*</td>
<td>Area cordoned off &amp; caution boards / tags provided.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Equipment electrically isolated and tagged vide</td>
<td></td>
<td></td>
<td>10</td>
<td>Gas test: HCs / Toxic etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Permit no.</td>
<td></td>
<td></td>
<td></td>
<td>HCs = % LEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Toxic gas = ppm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
1. The activity has the following expected residual hazards (Tick the relevant items): Lack of Oxygen / H2S, Toxic Gases / Combustible gases / Pyrophoric Iron / Corrosive Chemicals / Steam – Condensate / Others
2. Following additional PPE to be used in addition to standards PPE (Helmet, Safety Shoes, Hand gloves, Boiler suit): Face Shield / Apron / Goggles / Dust Respirator / Fresh Air Mask / Lifeline / Safety Belt / Airline / Earmuff etc.
3. Additional precaution if any:

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## Closing of the Work Permit

<table>
<thead>
<tr>
<th>Receiver: Certified that the subject work has been completed / stopped and area cleared</th>
<th>Issuer: Verified that the job has been completed and area cleared and is safe from any hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date &amp; Time</strong></td>
<td><strong>Name &amp; Designation</strong></td>
</tr>
</tbody>
</table>

## Clearance Renewal

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Additional Precautions if any, Otherwise mention “NIL.”</th>
<th>Issuer’s Name, Designation &amp; Signature</th>
<th>Receiver’s Name, Designation and Signature</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
General Instructions:

1. The work permit shall be filled up carefully and accurately in clear handwriting ensuring that complete information is provided in all the sections / subsections. Sketches should be provided wherever possible to avoid miscommunication.

2. Appropriate safe guards and required personnel protective equipment (PPEs) shall be determined by a careful analysis of the potential hazards and the operations to be performed prior to starting the work.

3. Requirement of standby personnel from Process / Maintenance / Contractor / Fire / Safety etc if any shall be mentioned in the additional requirement.

4. In case of fire alarm / siren, all work must immediately be stopped.

5. For renewal of work clearance, the issuer shall ensure that the conditions are satisfactory for the work to continue. If the conditions have changed, it may be necessary to issue a new permit or amend the existing permit.

6. This clearance on the same permit can be renewed / extended upto a maximum of seven calendar days.

7. This permit must be available at work site at all times.

8. On completion of the work, the permit shall be closed.

The industry may add other relevant instruction based on their operating and maintenance practices.
Annexure-II

WORK PERMIT
for
HOT WORK / ENTRY TO CONFINED SPACE

Work clearance from ____________ hrs of date ____________ To ____________ hrs of date ____________ (Valid for the shift unless renewed)

Issued to (Department / Section / Contractor)

Exact Location of work (Area / Unit / Equipment no. etc)

Description of work

---

THE FOLLOWING ITEMS SHALL BE CHECKED BEFORE ISSUING THE PERMIT
(Tick mark in the appropriate box. Checklist items marked with asterisk (*) shall be complied by receiver)

<table>
<thead>
<tr>
<th>Sr no</th>
<th>Item</th>
<th>Done</th>
<th>Not Req.</th>
<th>Sr no.</th>
<th>Item</th>
<th>Done</th>
<th>Not Req.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>General points</td>
<td></td>
<td></td>
<td></td>
<td>For Hot work / Entry to confined Space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Equipment / Work Area inspected</td>
<td>1</td>
<td></td>
<td>1</td>
<td>Proper ventilation and Lighting providing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Surrounding area checked, cleaned and covered</td>
<td>2</td>
<td></td>
<td>2</td>
<td>Proper means of exit / escape provided</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Sewers, manholes, CBD etc and hot surfaces</td>
<td>3</td>
<td></td>
<td>3</td>
<td>Standby personnel provided from Process /</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>nearby covered</td>
<td></td>
<td></td>
<td></td>
<td>Maint / Contractor / Fire / Safety dept.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Considered hazard from other operations and</td>
<td>4</td>
<td></td>
<td>4</td>
<td>Checked for oil and Gas trapped behind the</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>concerned persons alerted</td>
<td></td>
<td></td>
<td></td>
<td>lining in Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Equipment blinded/disconnected / closed /</td>
<td>5</td>
<td>*</td>
<td>5</td>
<td>Shield provided against spark</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>isolated / wedge opened</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Equipment properly drained and depressurized</td>
<td>6</td>
<td>*</td>
<td>6</td>
<td>Portable equipment / nozzles properly</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>grounded</td>
<td></td>
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<tr>
<td>7</td>
<td>Equipment properly steamed / purged</td>
<td>7</td>
<td>*</td>
<td>7</td>
<td>Standby persons provided for entry to</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>confined space</td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td>Equipment water flushed</td>
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<td></td>
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<tr>
<td>9</td>
<td>Iron sulfide removed / kept wet</td>
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<tr>
<td>10</td>
<td>Equipment electrically isolated and tagged</td>
<td>1</td>
<td>*</td>
<td></td>
<td>Spark Arrestor on the mobile equipment /</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>vide permit no.</td>
<td></td>
<td></td>
<td></td>
<td>vehicle provided.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Gas test / HCs = %LEL</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Toxic gas = ppm, O2 = %</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12</td>
<td>Running water hose / Fire extinguisher</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>provided. Fire water system available.</td>
<td></td>
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<tr>
<td>13</td>
<td>Area cordoned off and Precautionary tags /</td>
<td></td>
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<tr>
<td></td>
<td>Boards provided.</td>
<td>1</td>
<td></td>
<td>1</td>
<td>Clearance obtained for excavation / road</td>
<td></td>
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<td>cutting / Dyke cutting from concerned depart.</td>
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</tr>
</tbody>
</table>
REMARKS:

1. The activity has the following expected residual hazards (Tick the relevant items): Lack of Oxygen / H2S, Toxic Gases / Combustible gases / Pyrophoric Iron / Corrosive Chemicals / Steam – Condensate / Others

2. Following PPEs to be used in addition to standards PPEs (Helmet, Safety Shoes, Hand gloves, Boiler suit): Face Shield / Apron / Goggles / Dust Respirator / Fresh Air Mask / Lifeline / Safety Belt / Airline / Earmuff etc.

3. Additional precautions if any:


<table>
<thead>
<tr>
<th>Issuer Name &amp; Designation</th>
<th>Issuer Signature</th>
<th>Receiver Name and Designation</th>
<th>Receiver Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Clearance renewal

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Gas Test Values for HC's, Toxic, O2 etc</th>
<th>Additional precautions if any, Otherwise mention “NIL”</th>
<th>Issuer's Name, Designation &amp; Signature</th>
<th>Receiver Name, Designation and Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From</td>
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<td>To</td>
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</tbody>
</table>

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Closing of the work permit:

<table>
<thead>
<tr>
<th>Receiver: Certified that the subject work has been completed / stopped and area cleaned.</th>
<th>Issuer: Verified that the job has been completed and area cleaned and is safe from any hazard.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Date &amp; Time</th>
<th>Name &amp; Designation</th>
<th>Signature</th>
<th>Date &amp; Time</th>
<th>Name &amp; Designation</th>
<th>Signature</th>
</tr>
</thead>
</table>

General Instructions:

1. The work permit shall be filled up carefully and accurately in clear handwriting ensuring that complete information is provided in all sections / subsections and none of column is left blank. Sketches should be provided wherever possible to avoid miscommunication.
2. Appropriate safe guards and required personnel protective equipment shall be determined by a careful analysis of the potential hazards and the operations to be performed prior to starting the work.
3. In case of fire alarm / siren, all work must immediately be stopped.
4. Only certified vehicle / engines and permitted type of electrical equipment and tools are allowed in operating areas.
5. Welding machines should be located in non-hazardous and ventilated areas.
6. No hot work should be permitted unless the explosive meter reading is Zero.
7. When a person is entering confined space, the receiver must keep minimum two standby-designated persons at the manhole or entry point.
8. Before box up of any vessel manhole cover, ensure that no men / materials are inside the vessel.
9. For renewal of work clearance, the issuer shall ensure that the conditions are satisfactory for the work to continue. If the conditions have changed, it may be necessary to issue a new permit or amend the existing permit.
10. This clearance on the same permit can be renewed / extended upto a maximum of seven calendar days.
11. This permit must be available at work site at all times.
12. On completion of the work, the permit must be closed and kept as record.
13. The industry may add other relevant instructions based on their operating and maintenance practices.

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Annexure-III

**Electrical Isolation / Energisation Permit**

### Section-A: Isolation Permit.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Request for Isolation</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
</table>

Department / Section / Area issuing the permit

Equipment number to be isolated:

Name of the equipment / circuit to be isolated:

The above-mentioned equipment / circuit shall be de-energized and isolated from all live conductors to carry out the maintenance work by _______________ section / for operational requirement.

<table>
<thead>
<tr>
<th>Issuer Name</th>
<th>Designation</th>
<th>Signature</th>
</tr>
</thead>
</table>

### Certificate of Isolation:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
</table>

Certified that Equipment / Circuit no. ___________ of ___________ plant has been electrically isolated by switches / isolators / links / fuses (tick as applicable) and the danger tag is put on the supply panel. Actions in respect of electrical isolation have been recorded in the electrical shift logbook.

<table>
<thead>
<tr>
<th>Name of Authorized Person</th>
<th>Designation</th>
<th>Signature</th>
</tr>
</thead>
</table>

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### Section-B: Energisation Permit.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Request for Energisation</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
</table>

Department / Section / Area issuing the permit

Equipment number to be energized:

Name of the equipment / circuit to be energized:

---

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Work on the above mention equipment / circuit has been completed and all the applicable permits closed. This equipment / circuit may be energized.

<table>
<thead>
<tr>
<th>Issuer Name</th>
<th>Designation</th>
<th>Signature</th>
</tr>
</thead>
</table>

Certificate of Energisation:  
Date: ____________________________  
Time: ____________________________

Certified that Equipment / circuit no. ____________________ of ________________ plant has been electrically energized and the danger tag removed from the supply panel. This is also recorded in the electrical shift logbook.

<table>
<thead>
<tr>
<th>Name of Authorized Person</th>
<th>Designation</th>
<th>Signature</th>
</tr>
</thead>
</table>