



3141

हाइड्रोकार्बन महानिदेशालय

पेट्रोलियम और प्राकृतिक गैस मंत्रालय
भारत सरकार

DIRECTORATE GENERAL OF HYDROCARBONS

Ministry of Petroleum & Natural Gas
Government of India

Date: 25.07.2023

To,

The Registrar

National Green Tribunal

Faridkot House, Copernicus Marg,

New Delhi - 110 001

Sub: Report of the High-Level Committee set up by the Hon'ble National Green Tribunal (Principal Bench) vide order dated 19.02.2021 in OA No. 43/20202(EZ), in the matter of Bonani Kakkar Vs. Oil India Limited

Re: Baghjan Blow out incident in Assam

Sir,

The GOI was directed by way of:

- (i) Order dated 19.02.2021 passed by Hon'ble National Green Tribunal, Principal Bench at Delhi in the matter of Bonani Kakkar Vs. Oil India Limited [OA No. 43/20202(EZ) by NGT] to constitute a Committee;
- (ii) Order dated 23.01.2023 of the Hon'ble Supreme Court in the matter of Bonani Kakkar v. UOI [Civil Appeal No. 2201/2021] that committee earlier constituted by Hon'ble National Green Tribunal under Order dated 19.02.2021 to now proceed in terms of directions of the Tribunal;



We Care

OIDB BHAWAN, TOWER-A, PLOT NO. 2, SECTOR-73, NOIDA - 201 301

दूरभाष/Phone : +91-120-2472000 फैक्स/Fax : +91-120-2472049

[Signature]

In compliance of the aforesaid Orders, a Committee headed by the Secretary, MoPNG with following composition was constituted to examine the safety aspect and to prevent recurrence of such incident:

- 1) Secretary, Ministry of Petroleum and Natural Gas (Chairman)
- 2) Director General, Directorate General of Hydrocarbon (Member)
- 3) Chief Inspector of Mines & Head of Directorate General of Mines Safety (Member)
- 4) Chief Controller of Explosives, Petroleum and Explosive Safety Organization (Member)
- 5) Executive Director, Oil Industry Safety Directorate (Member –cum- Convener)

It is stated that the Committee undertook the exercise in conformity with the Terms of Reference and has prepared/finalized its report. (hereinafter referred to as the "**Report**").

In compliance of the aforesaid Orders & directions issued by the Hon'ble Supreme Court & National Green Tribunal, Principal Bench, Delhi the Report is being filed under the cover of the instant letter.

It is most respectfully prayed that the said Report may kindly be taken on record and be placed before the Hon'ble NGT, Principal Bench Delhi.

Thanking you,



Ms. Pooja Verma
Consultant (Environment)

For and Behalf of Directorate General of Hydrocarbons
(Ministry of Petroleum and Natural Gas)

भारत सरकार / Directorate General of Hydrocarbons
पेट्रोलियम और प्राकृतिक गैस मंत्रालय, भारत सरकार
Ministry of Petroleum & Natural Gas, Govt. of India
श्रीमान् श्री एम. पी. वरमा, टॉवर-ए, प्लॉट नं. 2, सेक्टर-73, नोडा-201301, भारत
SHRI MANI BHAWAN, Tower-A, Plot No. 2, Sector-73, Noida-201301, India

Enclosed : Report of the High Level Committee

1.0 Introduction

During work over operation, an incident of blowout (uncontrolled flow of gas and condensate) occurred in Baghjan #5 (BGN # 5) well in Tinsukia district, Assam of Oil India Ltd. (OIL) on 27th May, 2020 at around 10.30 hrs.

Uncontrolled flow of hydrocarbon from well BGN # 5 continued and on 9th June 2020, the well caught fire. Fire tenders from various organizations like OIL, ONGC and State Govt. etc. were put on service to cool down the area immediately after the blowout. Services of ONGC Well Control personnel as well as overseas experts of Alert Disaster Control Singapore were requisitioned by OIL to control the blowout and to extinguish the fire. The well was plugged and abandoned on 3rd December, 2020, thereby taking 190 days for control of blowout.

1.1 Order for constitution of five- member committee:

In compliance of order dated 19.02.2021 passed by the Principal Bench of National Green Tribunal, New Delhi (NGT) in Bonani Kakkar V/s Oil India Limited & Others, Original Application No. 43/2020 (EZ), the Government of India had constituted a five-member committee comprising of the following members: (copy of order is placed at Annexure-1)

1. Secretary, Ministry of Petroleum and Natural Gas (Chairman)
2. Director General, Directorate General of Hydrocarbon (Member)
3. Chief Inspector of Mines & Head of the Directorate General of Mines Safety (Member)
4. Chief Controller of Explosives, Petroleum and Explosives Safety Organization (Member)
5. Executive Director, Oil Industry Safety Directorate (Member cum Convener)

1.2 Terms of References (TORs):

1. Review the situation of Baghjan blowout incident in Assam,
2. Recommend the safety precautions required to be taken to prevent occurrence of such incidents,
3. Take appropriate remedial measures, including fixing responsibility for the failures of the concerned individuals of OIL in the present incident,
4. Lay down the road map for ensuring compliance of safety protocols by all similar installations, and
5. Recommend the mechanism for monitoring proper execution of the safety protocols.

The Committee may also suitably take into consideration the observations in the reports of the Committee appointed by NGT in *Bonani Kakkar V/s Oil India Limited & Others Original Application No. 43/2020 (EZ)*.

1.3 Methodology adopted by Committee:

- Analysis of facts and circumstances concerning the incident of blowout
- Review of various inquiry reports of committees constituted to look into BGN#5 blowout incident.
- Consideration of updated status from M/s OIL and other E&P companies
- Review of Action Taken Reports on previous recommendations
- Examination of documents and records of the incident (available with OISD)
- Internal deliberations by committee members and consultation with experts

2.0 Background:

Well Baghjan #5 (BGN#5) is located in the district Tinsukia, Assam in Baghjan PML¹ having an area of around 75 sq. km. Total 26 wells had been drilled in the PML area and 18 wells were under production.

The well Baghjan #5 was drilled in 2006 and completed with 5 ½" casing at 3899 m. The well was opened in the Langpar sand (Well BGN 001 Block) initially from 3869.5 - 3872.5 m, which mainly produced gas (3400 psi FTHP²). However, detailed production testing could not be carried out because of the unavailability of infrastructure to produce gas at that time. Therefore, the well was killed with 85 pcf³ mud and plugged back by setting a bridge plug at 3868 m. Subsequently, the well fluid was changed over to water from mud and completed with open end tubing with shoe at 496 m and was kept shut-in.

Well was put in production in September 2015, with 4 mm bean, producing 88000 SCMD⁴ gas with 29 klpd⁵ condensate (API 42 deg) at 3400 FTHP from the gas cap of BGN001 block. As this could lead to fast depletion of the reservoir pressure resulting in reduced recovery of gas, it was decided in 2020 to plug back the existing (3869.5-3872.5 m) Langpar sand and complete the well higher-up in the 3729 m LK+TH I+II sand.

¹ Petroleum Mining Lease

² Flowing tubing head pressure

³ Pounds per cubic foot

⁴ Standard cubic meter per day

⁵ Kilo litre per day

In the second workover operation in April-May 2020, being carried out by charter hired rig of M/s John Energy Ltd. (JEL), the well was subdued with 73 pcf sodium format solution (9.7 ppg⁶). The existing perforation at Langpar sand was isolated by setting a bridge plug at 3865 m, which was tested and found in order. Recorded CBL- VDL- CAST log in the range of 3862-3600 m and from 500 m up to surface, which showed poor cement bonding against the sand ranges, but good bonding above and below the object sand and no major casing anomaly was observed.

Retainer packer was set at 3590 m and the well was completed with premium tubing and TSA (Tubing Stabbing Assembly) stabbed on to the retainer packer. Perforation was carried out at 3731.5 - 3737.5 m through tubing and immediate pressure build-up of 300 psi was observed. Pressure gradually increased to 4400 psi as STHP⁷ and 3900 psi as SICP⁸ and found pressure of 500 psi in 'B' section annulus.

Due to 'B' section pressure build-up, it was decided to subdue the well, pull out the string and TSA and to test the well head. On testing, well finishing spool (WF) also called tubing spool, was found leaking. Subsequently it was decided to repair and replace the WF spool, thereafter the well was subdued and the string was pulled out.

On 25th May, a cement plug of 100 m length was placed from 1000 m to 900 m to isolate the existing perforated gas zone. Well was to be kept under waiting on cement (WOC) from 26th May (4 pm) for 48 hrs. as per plan to further complete the well in the same LK+TH I+II sand with premium tubing.

On 27th May 2020, the 2^{7/8}" drill pipe string was pulled out of the hole after waiting only for 12 hours against the planned WOC of 48 hrs. and then between 7 to 9 in the morning, blowout preventer (BOP) was removed from the well head.

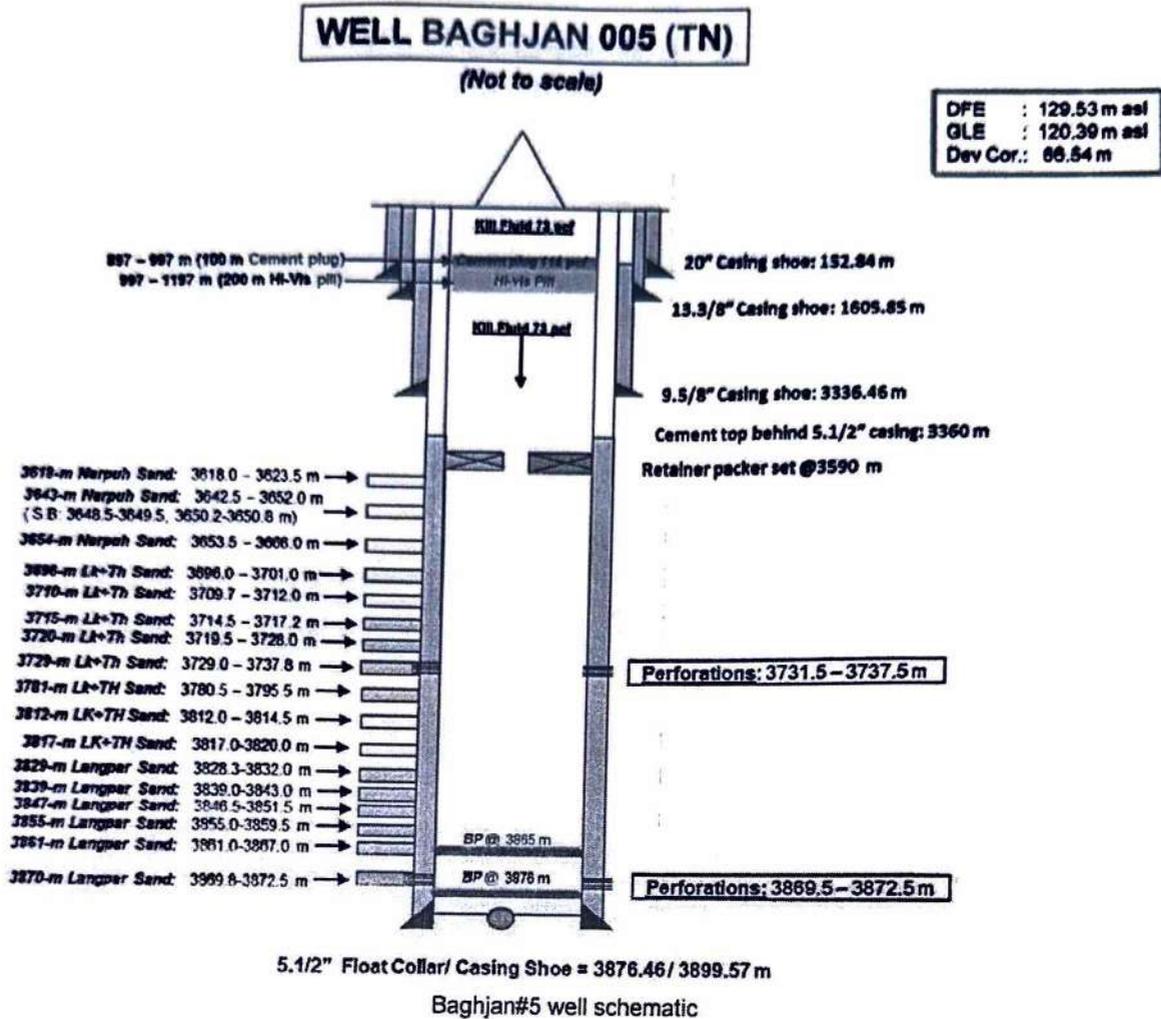
Arrangement was made to nipple down the tubing spool. During the process, little amount of displacement was observed from the well. The crew attempted to run in 2^{7/8}" tubing and tried to install tubing hanger cone. Flow increased and tubing hanger cone could not be placed due to increased flow rate from the well. After that the flow rapidly became uncontrolled, leading to blowout.

Well experienced blowout at 10.30 am on 27th May, 2020 and a fortnight later, on 9th June 2020, the well caught fire, with flames raging upto 30 m high.

⁶ Pounds per gallon

⁷ Shut-in tubing head pressure

⁸ Shut-in casing pressure

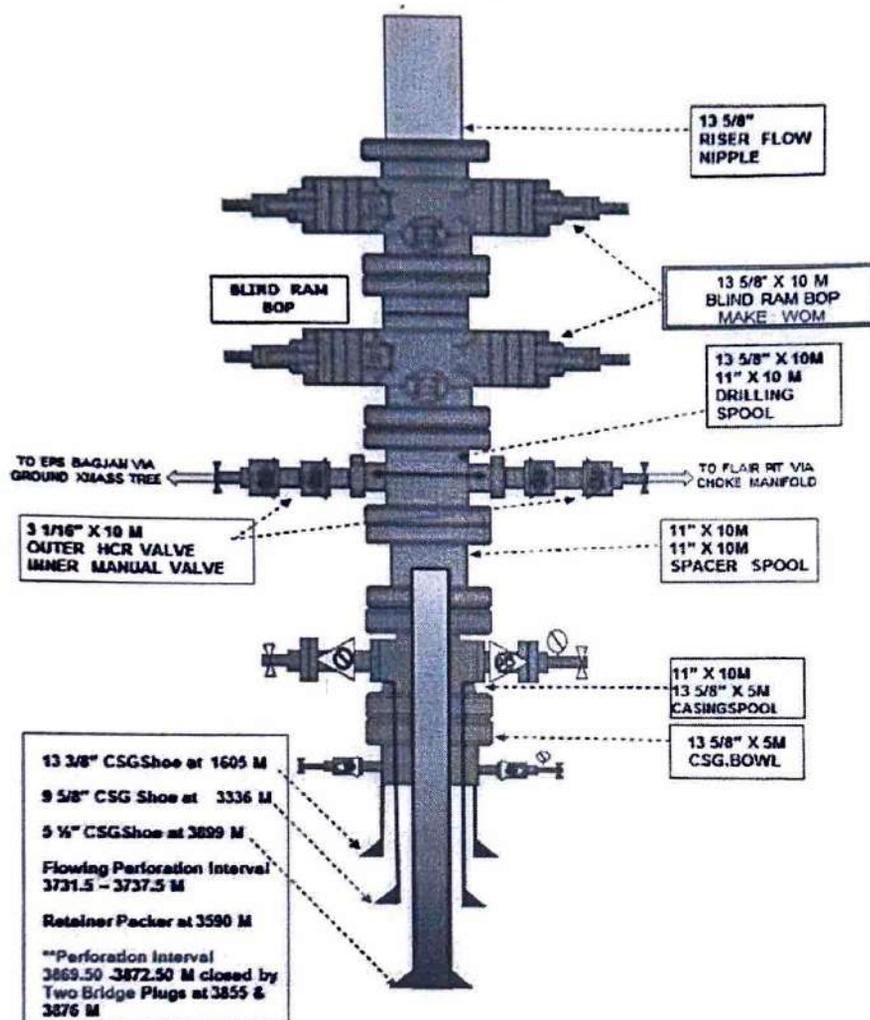


3.0 Actions taken after well blowout

Emergency equipment including fire tenders from various organizations like OIL, ONGC and State Govt. etc. were pressed into service immediately after the blowout. Services of specialized well control personnel of ONGC (Crisis Management Team) as well as overseas experts of M/s Alert Disaster control (Asia) Private Ltd, Singapore were roped in urgently to control the blowout and to extinguish the fire. Meantime, evacuation of local residents was done to a safe distance and relief camps were set up by OIL.

Mobilization of blowout control equipment from outside and well site preparation and commissioning of blowout control equipment had been done to control blowout. Debris were removed from well site. Process was initiated to acquire land for drilling relief well. Three attempts to cap the well with the help of well

control equipment were made and the affected well was finally capped on 17th August, 2020 as shown in the diagram below.



Baghjan#5 well after successful installation of capping assembly

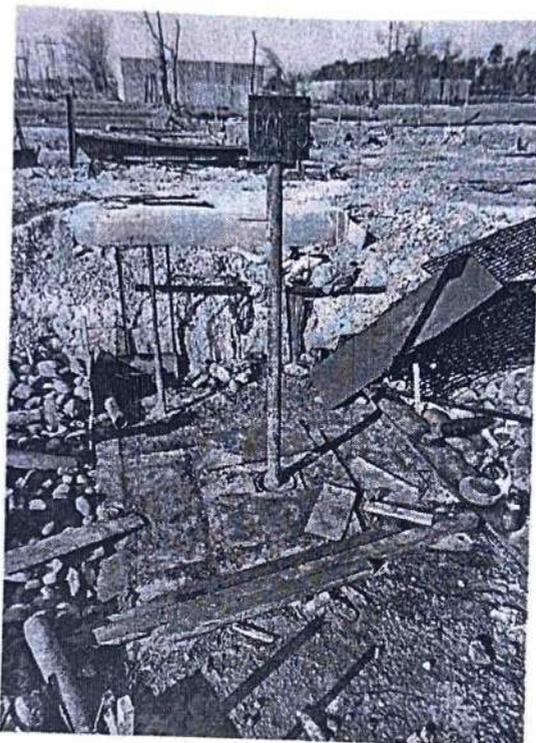
Killing of well through bull heading was attempted with mud of 13.7 ppg. Pumping pressure rose up to 6580 psi. While pumping, side outlet bull plug on casing bowl of C section (13 3/8" X 9 5/8") blew off resulting in leakage of mud mixed with gas, a clear indication of communication between all casing strings. Made further arrangements and diverted the major part of flow (gas and condensate) from blowing well to nearby production facility at EPS Baghjan and burning remaining gas in flare pit.

On 4th November, 2020, snubbing unit from Alberta, Canada reached at site and commenced snubbing operation on 9th November, 2020.

Finally, the well was killed with 78 pcf Sodium formate brine. Well came under control on 15th November, 2020. Isolation cement plug was placed at 3855 m on 17th November, 2020.

Completion of Blow out control operation

Two isolation cement plugs were placed and the well was finally abandoned on 3rd December, 2020. The blowout control operation was thus completed after 190 days of blowout, making it one of the longest blowout in the industry. Photographs related to the incident and blowout control activities is placed at Annexure-2.



Well Baghjan#5 after blowout control and abandonment

3.1 Other damages/ losses due to well blowout incident and their assessment

The blowout incident caused significant damage to environment which is being reviewed by another committee(s) as per direction by NGT/ Supreme Court.

A seven-member joint Committee comprising MoEF&CC, CPCB, State PCB, SEIAA Assam, Chief Wildlife Warden, Assam, Member Secretary, Biodiversity Board, Assam and Member Secretary, State Wetland Authority Assam would study the issue of accountability for the past compliances and the remedial action thereof. MoEF&CC will be nodal agency.

A five-member Committee headed by Justice BP Katakey, former Judge of the Guwahati High Court will look into the aspect of assessment of damage to the environment and remedial restoration plan, including Dibru-Saikhowa National Park (DSNP) and the Maguri-Motapung Wetland.

During blowout control operation (well capping operation), Oil India Limited (OIL) had lost three employees (two fire officers and later one electrical engineer).

4.0 Review of reports of the Committees which inquired into Baghjan#5 blowout incident:

The following committees have inquired into the blowout incident:

1. Three-member High Level Expert Committee constituted by the Ministry of Petroleum and Natural Gas, Govt. of India, comprising of Shri. S.C.L. Das, Director General Hydrocarbon, Govt. of India, Shri B.C. Bora, former Chairman ONGC and Shri T.K. Sengupta, former Director, ONGC vide Order No. Expl15022(13)/7/2020-ONG-V dated 11.06.20
2. Inquiry conducted by the Directorate General of Mines Safety (DGMS), Govt. of India under the Mines Act, 1952.
3. Orders passed by Hon'ble NGT OA No. 43-2020-EZ
4. Two-member inquiry committee constituted by Oil Industry Safety Directorate (OISD) under MoP&NG dated 30.05.2020
5. A four-member inquiry committee constituted by OISD dated 10.02.2021 to investigate post blowout activities and fatalities during blowout control on the recommendation of HLC.
6. A six-member committee constituted by OISD based on recommendation of MoP&NG to standardise the 'System of SOP in the industry'.
7. One-member Expert Committee headed by the Addl. PCCF(WL&CWLW) constituted by Environment & Forest Department, Govt. of Assam vide Order No.FRW.6/2020/1 dated 12.06.2020
8. One Person Enquiry Committee headed by the Addl. Chief Secretary, Govt. of Assam vide Order No. HMA/19/50//2020-Pol(A)/4 dated 12.06.2020
9. Four-member expert committee constituted by the Directorate of Geology and Mining, Govt. of Assam vide Order No.GM/MM/160/Pte.L/95 dated 04.06.2020

4.1 Lapses:

Committee findings related with lapses which led to the blowout incident are summarised below, which is based on the analysis of facts and circumstances

pertaining to the incident, understanding of the ground situation gained from previous site visits and examination/review of:

- available inquiry reports
- documents and records collected by OISD during the inquiry by OISD as well as High level committee
- Field visit of blowout site and OIL Dullajan by the Committee members during blowout period
- Interaction with various stakeholders done by the Committee members during and after blowout period

4.1.1 Planning Level:

1. Workover plan was issued by G&R⁹ group, unlike other major operators, where such plans are collectively prepared and signed by all relevant groups. There is every likelihood of missing important instruction like in this case, instruction for 'tagging and testing of cement plug' was missed.
2. Coordination amongst key stakeholders in the formulation of workover plan and its amendments was found inadequate. The pressure build-up in the well BGN#5 annulus A and B was known before commencement of the workover operation. However, it was neither mentioned nor factored in the first workover plan. Had this been done, the programme to change the WF Spool could have been planned and undertaken very safely after the setting (and testing) of the bridge plug at 3865 m, i.e. before the upper zone at 3731.5-3737.5 m was opened.
3. Kill fluid used for killing the lower 3870 m Langpar Sand (73 pcf sodium formate solution) was also used for killing upper LK+TH I+II sand from 3731.5 to 3737.5 m considering its availability at the well site. As informed by OIL, formation pressure of this sand was not known. The planners didn't take cognizance of the fact that this zone is a high-pressure gas reservoir in the initial plan issued on 28th April and 11th May 2020. However, in the addendum plan issued on 27th May 2020 (on the day of blowout), it is stated that this is a high pressure gas well.
4. The cement plug was planned at a shallow depth from 1000 to 900 m. This cement plug being the second barrier is generally planned in deeper depth to be away from the shallower deviated section for a better setting. Planners failed to include tagging and testing of cement plug, without which existence of second barrier cannot be established.

⁹ Geology & Reservoir

5. The perforation was from 3731.5 to 3737.5 m and the retainer packer was at 3590 m with a gap of around 140-150 m. As tubing was punctured at 3574 m and the well was killed and circulated from that cut point only, thus the lower 157 m section was full of gas. Since the pressure was being communicated in annulus on activation, there was every likelihood of packer not holding. This aspect was not taken seriously either by planners nor by the executor during the operation. It might have happened that the gas has slowly percolated through the unset cement to the surface, lightened the hydrostatic head and caused the blowout.
6. Inclusion of gas block additives was not considered during the designing of cement slurry by the cementing design planner for gas well.

4.1.2 Execution level:

1. Verification of the position and strength of the cement plug was also missed by the execution team at field before nipple down of BOP.
2. Waiting on cement (WOC) which was 48 hours was compromised by OIL and officially instructed M/s John Energy rig crew to start to pull out after 12 hours only in violation of the plan.
3. After pull out was complete, crew nipple down the BOP, even though the cement has not yet set. There was no written instruction for any further operation after pull out.
4. Well was not kept under observation for the time period equivalent to the anticipated time required till re-installation of BOP plus safety margin as required by clause 7.10.4 of OISD-RP-238, before nipple down of BOP.
5. Number of critical instructions were reported to have been exchanged on phone.
6. There was deficiency in understanding of the gravity of a critical operation like removal of BOP without having a confirmed and tested secondary safety barrier. Safely carrying out workover of well following all established procedures is also the responsibility of execution team including Installation Manager.
7. No representative of OIL (Installation Manager or production engineer) was present during this critical operation. Even Tool Pusher of M/s JEL was also not present at the rig site during this operation.
8. After detecting kick (initial flow of fluid from well), shift in-charge and the crew present at site did not acted to control the well. They wasted precious time in taking instructions resulting in blowout.

4.1.3 Organization level:

1. There are no comprehensive manuals like for the workover operations, as developed and practiced by major E&P organization. In absence of such documents, it becomes difficult to standardise practices in conformity to various requirements, as seen in case of Baghjan.
2. The accountability and the responsibility of workover operations are distributed amongst several departments and several persons in OIL.
3. Installation Manager (IM), who is supposed to be in-charge of and responsible for all operations and activities on or in connection with the installation, was looking after three workover rigs (spread in large geographical area). Because of multiple responsibilities, he could attend only a few days to a particular rig operation in a month. This is in violation of clause 29 of OMR 2017 regarding 'duty and responsibility of installation manager'. As per clause 29 (e), IM is required to visit and examine the installation or part thereof under his charge on every working day to see that safety in every respect is ensured.
4. The current system of selection of outsourced rig, equipment and key rig personnel focus on selecting lowest bidder (among technically acceptable bidders) which does not ensure the quality and reliability of the contractor, equipment and manpower.
5. Contractually, the rigs with manpower are hired on a competitive bidding basis and verification of document of training, experience etc. of important manpower is done through paper only. The contractor failed to provide crew, specifically key personnel, of required competency. Accordingly, the crew with poor knowledge in well control failed to live up in the crisis.
6. Well control trainings are not being provided to assistant driller and production people of OGPS¹⁰, who cover the well testing on work over rigs.
7. The crisis management team (CMT) of OIL was lacking in resources, both experienced manpower as well as equipment and to handle blowout situation and to oversee the well control preparedness at sites through BOP testing and BOP drills.

4.1.4 Lapses by Contractor (JEL):

1. Once the pull-out was complete, the John rig crew started removal of BOP to change the well head before completion of WOC in deviation of plan without any written instruction from OIL. Moreover, Rig Manager/ Tool

¹⁰ Oil and gas Production Services

- pusher of JEL failed to communicate to the IM about the deviation from the plan for nipple down of BOP much before the planned 48 hours WOC in contravention to the provisions of contract and bridging document.
2. After detecting kick (initial flow of fluid from well), the JEL crew failed to respond immediately for taking all preventive and corrective measures for initial control of kick and lost golden hour. After detecting kick, they waited for the instruction of OIL officials for the next course of action which is a violation of well control procedure and clause 3.11 of bridging document, which clearly states that JEL shall be responsible for taking all measures for initial control of kick.
 3. Tool Pusher of JEL were not present at the rig site to attend the critical operation of replacement of tubing spool in high-pressure gas well.
 4. Other lapses include - poor record-keeping by JEL rig crew, improper BOP testing and drills, ineffective safety meeting, a poor internal communication system for passing on the instruction, not adherence to SOP, lack of skilled manpower etc.

4.2 Root causes of the incident:

1. The gas column of more than 150 m present in the well seems to have slowly percolated through the unset cement to the surface, lightened the hydrostatic head and caused the blowout.
2. Verification of the position and strength of the cement plug was neither planned, nor executed before nipple down of BOP.
3. Moreover, once the pull out was complete, the rig crew nipple down the BOP to change the well head, even though the cement had not set in.
4. After detecting kick (initial flow of fluid from well), the JEL rig crew did not act swiftly to re-gain control of the well. They wasted precious time in taking instructions resulting in the situation getting out of hand as blowout.

5.0 Remedial measures taken by M/s OIL & other E&P companies

OISD shared the recommendations of High Level Committee and OISD committee with the upstream oil & gas companies for compliance. It also shared learnings from Baghjan#5 blowout incident in various fora to sensitize the industry for avoiding recurrence of such incidents. OISD had also received compliance status from major and medium E&P companies.

5.1 Fixing responsibility for the failures:

5.1.1 Fixing responsibility of Mines Management by DGMS:

DGMS, as regulator under Mines Act 1952 and Oil Mines Regulation 2017 conducted inquiry into the dangerous occurrence at work over mine (Baghjan Well No. 5) of M/s Oil India limited. Based on inquiry, the Nominated Owner, Agent, Mine Manager, Dy. Mine manager, Installation manager and Chief Engineer-Oil & Gas Production services of M/s Oil India limited were held responsible for contravention of provisions of the Mines Act 1952 and the Oil Mines Regulations 2017.

Subsequently, petition under section 73 of the Mines Act, 1952 was filed against the aforementioned delinquents at Hon'ble court of Chief Judicial Magistrate, Tinsukia, Assam on 18.11.2020. At present, the case is pending before Hon'ble court of Chief Judicial Magistrate, Tinsukia.

5.1.2 Fixing responsibility by OIL Management:

Internal inquiry of such incidents for identifying the causes of incident and fixing responsibility is a standard practice in the industry. Internal inquiries were also carried out after Baghjan incident and based on the findings of internal as well as external inquiries, actions had been initiated.

Common disciplinary proceedings have been initiated against eighteen executives under Rule 25 (r/w Rule-29) of OIECDA Rules 1982 (As amended).

M/s OIL had also initiated action against M/s John Energy Limited (JEL) by putting them on "Holiday List" and debarred from doing business with M/s OIL till 30.04.2021.

6.0 Recommendations

This Committee cogitated on the various aspects of the incident and the factors leading to the blowout and its persistence for 190 long days before it could be controlled. The Committee reviewed reports of various inquiry committees including their observations, findings and recommendations and extensively deliberated on them so as to arrive at measures for improvement of the operating system to avoid recurrence of such incidents in future.

This Committee also deliberated upon the recommendations of committees set up by OISD on the instructions of MoP&NG

- for review of process of establishing and implementing SOP
- to review post blowout activities at Baghjan#5

the Committee obtained updated status from M/s OIL and other E&P companies and reviewed Action Taken Report (ATR) on recommendations. Committee also

deliberated upon gaps in HSE competency of small & medium level players in E&P industry, as many of them are new to this sector.

Based on detailed deliberations, the Committee recommends the following recommendations to be implemented across all E&P companies (organisational as well as at installation level, as applicable). Some of the recommendations are generic in nature and should be implemented across all oil and gas companies (as applicable)

6.1 Planning level

1. Workover plan should be prepared in detail by a multi-disciplinary team (MDT) after due deliberation and consideration of all available information and possible hazards. Any change in the plan should be approved by the competent authority and communicated through mail/ message in writing.
2. Isolation of any hydrocarbon bearing zone by a secondary barrier must be taken very seriously and needs to be planned properly. Secondary barrier must be tested both positively and negatively to check its integrity before attending any critical operation in the well.
3. Cementation job in the high-pressure gas well should be planned diligently with gas block additives to effectively seal against gas migration pressure. Sufficient time should be allowed to set the cement as mentioned in the plan.

6.2 Execution level

4. Cement plug should be tagged and tested to ensure its position and strength before commencing next operation.
5. Well should be kept under observation for the time period equivalent to the anticipated time required till re-installation of BOP plus safety margin as required by clause 7.10.4 of OISD-RP-238, before removing X-mas tree or BOP.
6. BOP function test and pressure test should be done in line with API RP 53/ OISD-RP-174. These tests should be recorded in DPR and should also be witnessed by operator's representative. BOP pressure test should be done by test pump with chart recorder.
7. Other high pressure equipment like choke manifold, kill manifold, FOSV, Kelly cock etc. should also be pressure tested as per API RP 53/ OISD-RP-174.

8. All down hole equipment should be properly checked before lowering into the well. Any pressure builds up in annulus 'A' when annulus is isolated with packer, should be analysed and corrective measures planned.

6.3 HSE Management System

9. Organizations should establish HSE Management System in line with international standards like ISO 45001 for Occupational Health & Safety and ISO 14001 for Environment Management.
10. Organizations should develop comprehensive manuals for workover, drilling, production, pipeline operations etc. covering all operations in detail, which shall act as the guiding document covering all operations.
11. Organizations should maintain all necessary documents & records, as per legal requirements and OISD standards.
12. Safety meeting by installation in-charge should be conducted on a weekly basis and by senior management level at least once in six months apart from regular safety committee meeting as per statutory requirement.
13. Organizations should improve communication between various functionaries involved in designing, planning and execution.
14. Organizations should adopt Quality and Cost Based Sourcing (QCBS) methodology for contracting services considering Safety capabilities of the bidder. Competency criteria for key operational personnel of services should be explicitly included in tender and to be ensured through interviewing key operational personnel.
15. Organizations should conduct internal audit of all installations by specially constituted MDT once every year as per OISD-STD-145 in addition to safety inspections by senior officers and in-charge location.
16. Organizations should review and strengthen their internal controls including maintenance & inspection (M&I); inspection/ audits; system of addressing inspection/ audit observations raised by regulator, OISD, third party and internal teams and corrective actions based on reporting & investigation of incident, unsafe act/ condition.

6.4 HSE organization & manning

17. Installation Manager (IM) should be responsible for one workover rig only. All communication from operator's official should be communicated to contractor's Tool Pusher/ Rig Manager through Installation Manager.

18. Chief of HSE at Corporate level, headed by senior level officer should directly report to CMD. All heads of HSE of different regions and groups should report to this group.
19. All operators including small & medium and major contractors should establish dedicated HSE group, manned by HSE specialists of required strength based on organisational activities.
20. Organizations should appoint sufficient number of competent persons and officials as is sufficient to secure, during each of the working shift required under Reg. 21(1)(2) of the OMR, 2017.
21. Board and HSE sub-Committee should review HSE management system effectiveness, HSE performance, major accidents and investigation reports, compliances to various audit recommendations specifically long-pending ones, at least twice in a year.

6.5 Training & Competency

22. Organizations should carry out gap analysis w.r.t. training requirements (based on regulatory, OISD-STD-176 and OISD-RP-174 requirements apart from organization's own requirements). Required trainings need to be imparted based on gap analysis to develop competency.
23. Well control training (of appropriate type and level) should be mandatory for key personnel of rigs (up to assistant driller level) and also recommended for production engineers working in well services section like OGPS.
24. All major players in oil & gas industry who have well established infrastructure for providing training facilities should share their training facilities with other operators/ companies on no profit no loss basis. Efforts should be made to accommodate 10% of employees of other small E&P companies in their annual training calendar. DGH can facilitate dissemination of information on available training courses with fees through their portal.

6.6 Emergency preparedness & response

25. Organizations should establish a comprehensive blowout contingency plan covering various emergency scenarios (including situation when there is no BOP on the wellhead) to face any eventuality without any delay.
26. Organizations should develop a strong Crisis Management Team well equipped and trained to handle blowouts and/ or enter into MoU with

- established organization(s) in blowout management for enhancing preparedness in case of a blowout.
27. E&P companies should work towards establishing 'Blowout emergency response equipment centre' with all necessary identified equipment, region wise for responding in shortest possible time in case of a blowout.
 28. Provisions of the Disaster Management Act, 2005 and Rules thereunder may be invoked in case of blowout. District administration should facilitate in earmarking a suitable area near the blowout well for developing emergency facilities and for drilling of relief well for early containment of the disaster.
 29. Disaster Management Plan (DMP) of Districts and organizations should be reviewed and suitably revised in view of this incident.

6.7 Adherence to SOPs

30. Organizations shall prepare list of activities, covering all cross section of work, for which SOP is required to be maintained, duly approved by the Management.
31. Based on the approved list, gap analysis should be done. SOP should be prepared by area experts covering statutory and OISD standards requirements.
32. Organizations shall define the authorities for approving SOP at different levels.
33. Review or revision of SOP shall be taken up every three years or earlier as necessary.
34. Organizations shall establish methodology for effective implementation of SOP - creating awareness; display and accessibility; adherence; verification of implementation of SOP through periodical assurance programs and audits
35. In case of hired services, SOP (of organization or contractor) which will prevail shall be controlled through bridging document before start of the assignment.

6.8 IT-enabled System, adoption of new technologies

36. Organizations should implement IT-enabled system to ensure availability of real-time information on critical operational parameters to relevant officers (including on mobile) for improved decision making and to ensure higher attention to safety.

37. Organizations should establish system of surveillance of installations (including rigs) through CCTV. Start-up and other critical operations (like this incident) should be closely monitored through CCTV either at installation/ remotely at base.
38. Emphasis should be given for fast introduction of new/ latest technologies developments in hardware (rigs, equipment)/ software (use of artificial intelligence & machine learning) for better reporting, analysis, monitoring and control.

6.9 Safety culture

39. Empowerment of crew: Any member of the crew, irrespective of seniority, position or department (including contract crew) should be empowered to shut down an ongoing operation in the event of deviation from programme, perception of danger or inability to understand the way forward.
40. Organizations should carry out a survey to assess safety culture on a periodic basis. Based on findings, measures should be taken to improve safety culture.
41. Organizations should develop a zero-tolerance policy for operational lapses and fix responsibility on all persons responsible for the lapses and initiate departmental action against them. Similarly, responsibility should be fixed on the contractor's company for its functional lapses and action taken against it for the acts of omission and commission contributing to the incident.

7.0 Road map for ensuring compliance of safety protocols for all similar installations/ mechanism for monitoring proper execution of safety protocols

The committee recommends the following mechanism for monitoring proper execution of safety protocols.

7.1. At Organization level:

1. Each organization should set up a special task force consisting of officers at appropriate level from HSE, operations, maintenance etc. to monitor compliance to the recommendations as recommended by this Committee. For this purpose, organization may look into developing a suitable software to monitor compliance on each & every installation till closure.
2. Compliance of recommendations should be verified during the internal inspection/ audit. This could be done through using revised checklist of

OISD, which will be issued in next couple of months incorporating all the relevant recommendations.

3. Each organization should set up system for monitoring compliance to recommendations at:
 - o Executive Committee level on six monthly basis
 - o Board at least on annual basis
4. Each organization shall submit the compliance status report to OISD on quarterly basis as per format devised by OISD.

7.2. At OISD level:

1. Implementation of recommendations shall be monitored, organization wise, on quarterly basis till satisfactory closure.
2. Review/ revision of relevant OISD standards on Well control, Safety Management System, Workover, Drilling, training etc. to incorporate recommendations suitably.
3. Safety audit checklist to be further reviewed and revised to incorporate recommendations of this Committee.
4. Compliance of the recommendations should be verified during the External Safety Audit.
5. OISD is currently carrying out external safety audit at installation level only. However, this practice presents a gap in terms of assessing HSE system at organisational level and review of corporate level documents. It is recommended that OISD should also carry out audit at the organizational level.

7.3. At DGMS/ PESO level:

Implementation of recommendations to be monitored during safety inspection

7.4. At DGH level:

1. DGH should facilitate implementation of recommendation at Sl. No. 24, section 6.1.5 regarding training.
2. DGH should get associated with OISD for carrying out audit at the organizational level of E&P organizations.
3. DGH should also focus on compliance of these recommendations by E&P organizations, especially small & medium organizations.

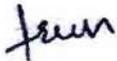
7.5. At Ministry level:

Status of implementation of all recommendations, as included in this report, to be monitored by MoP&NG through:

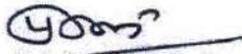
1. OISD on quarterly basis
2. Review meeting chaired by Addl. Secretary (Exp.) once in six months, with Heads/ Senior representatives from DGMS, DGH and all major E&P companies (both PSU and Private). ED-OISD shall be the member co-ordinator of the Committee.
3. Safety Council, once every year

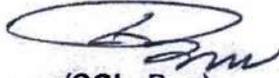
8.0 Conclusion:

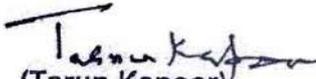
The Baghjan blowout incident was a major industrial disaster which throws up important lessons that need to be taken seriously and measures taken so that such a recurrence is strictly averted. Recommendations of the committee should be implementation by the industry. Committee is of the view that if these recommendations are implemented in true spirit by Organizations, it will go a long way in improving the overall safety performance.


(Arun Mittal)
ED-OISD


(P. Kumar)
CCOE-PESO


(Prabhat Kumar)
DG-DGMS


(SCL. Das)
DG-DGH


(Tarun Kapoor)
Secretary, MoP&NG

**F. No. Expl-12027(11)/4/2021-EXPL-II-PNG [E-37640]
Government of India
Ministry of Petroleum and Natural Gas**

Shastri Bhawan, New Delhi

Dated : 27th May, 2021

ORDER

In compliance of order dated 19.02.2021 (copy enclosed) passed by the Principal Bench of National Green Tribunal, New Delhi (NGT) in *Bonani Kakkar v. Oil India Limited & Others* Original Application No. 43/2020 (EZ), the Government of India hereby constitutes a five-member committee, comprising of the following:-

- i. Secretary, Ministry of Petroleum and Natural Gas (Chairman)
 - ii. Director General, Directorate General of Hydrocarbons (Member)
 - iii. Chief Inspector of Mines & Head of the Directorate General of Mines Safety (Member)
 - iv. Executive Director, Oil Industry Safety Directorate (Member cum Convener)
 - v. Chief Controller of Explosives, Petroleum and Explosives Safety Organization, New Delhi (Member)
2. The Committee shall:
- i. review the situation of Baghjan blowout incident in Assam,
 - ii. recommend the safety precautions required to be taken to prevent occurrence of such incidents,
 - iii. take appropriate remedial measures, including fixing responsibility for the failures of the concerned individuals of OIL in the present incident,
 - iv. lay down the road map for ensuring compliance of safety protocols by all similar installations, and
 - v. recommend the mechanism for monitoring proper execution of the safety protocols.

Contd../-

dy
27.5.2021

-2-

3. The Committee may also suitably take into consideration the observations in the reports of the Committee appointed by NGT in *Bonani Kakkar v. Oil India Limited & Others* Original Application No. 43/2020 (EZ). The Committee shall submit its report by 15.07.2021.

4. DGH shall provide the necessary secretarial and technical assistance to the Committee as may be required from time to time.

du 27-05-2021

(Amar Nath)

Additional Secretary to the Government of India

Tel: 23381832

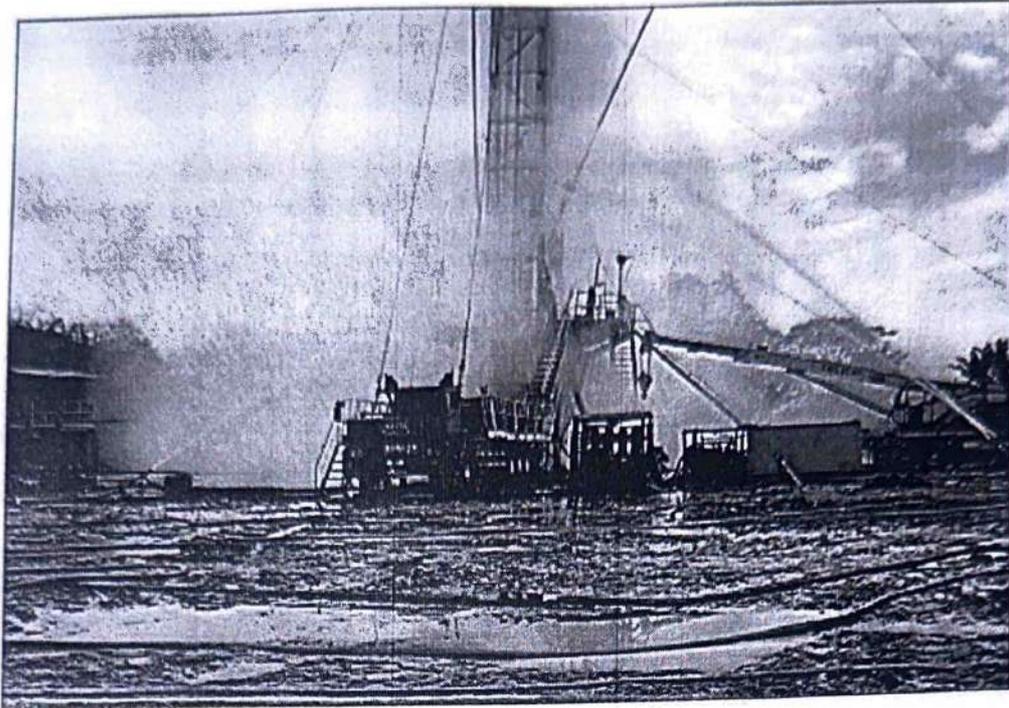
End: As Above

1. Director General,
Directorate General of Hydrocarbons
(DGH) OIBD Bhawan, Noida
2. Chief Inspector of Mines & Head,
Directorate General of Mines Safety
(DGMS) Head Office, Dhanbad-826016
3. Executive Director,
Oil Industry Safety Directorate
(OISD) 8th Floor, OIBD Bhawan,
Noida
4. Chief Controller of Explosives, PESO
CGO Complex, 5th, A Block, Seminary
Hills Nagpur, Maharashtra 440001

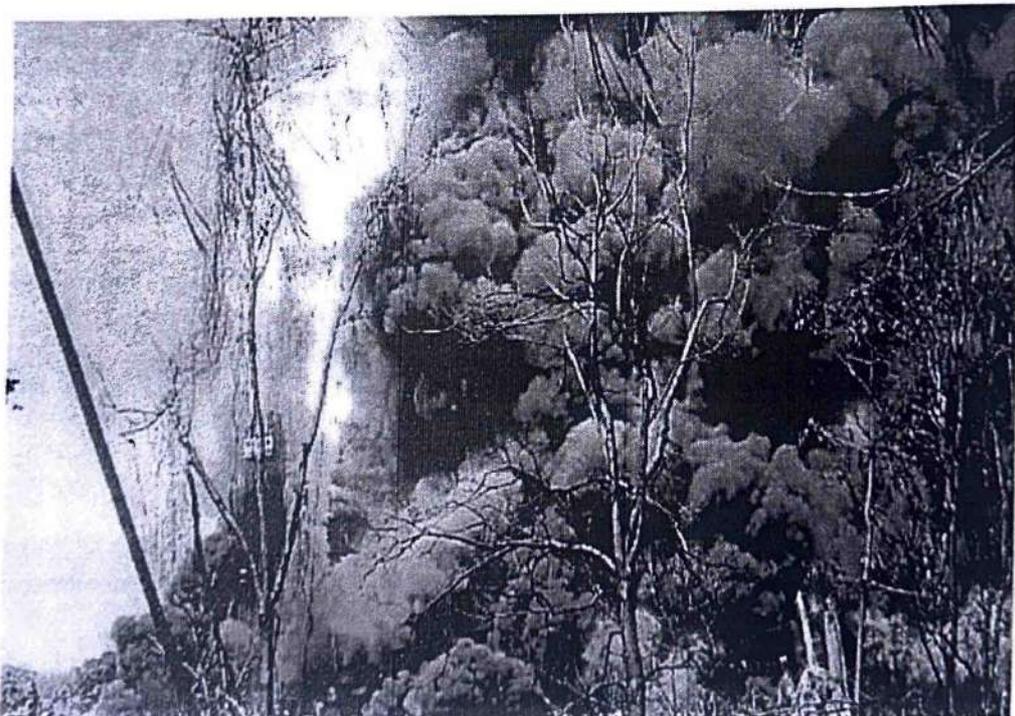
Copy To:

1. PPS to Secretary, MoPNG
2. CMD, OIL----Kindly furnish all necessary documents related to the *Bonani Kakkar v. Oil India Limited & Others*, Original Application No. 43/2020 (EZ) together with copies of the Reports submitted by the Committees constituted by NGT in the matter to the DGH/members of the Committee.

Annexure 2



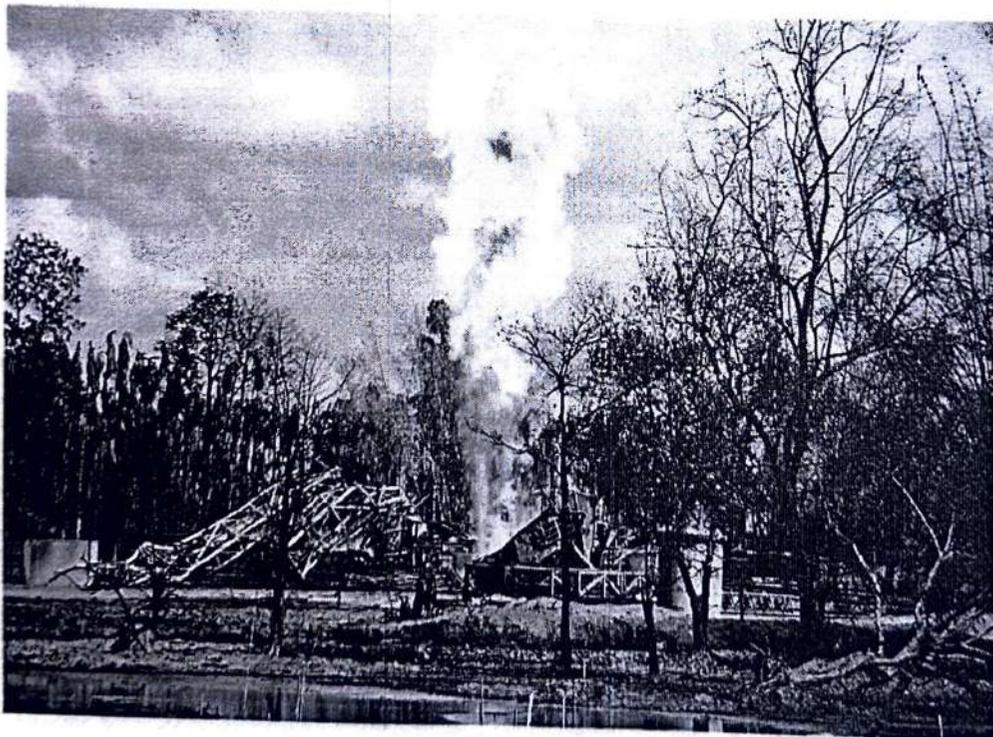
Well Baghjan#5 had blown out on 27th May, 2020 (Cooling in progress)



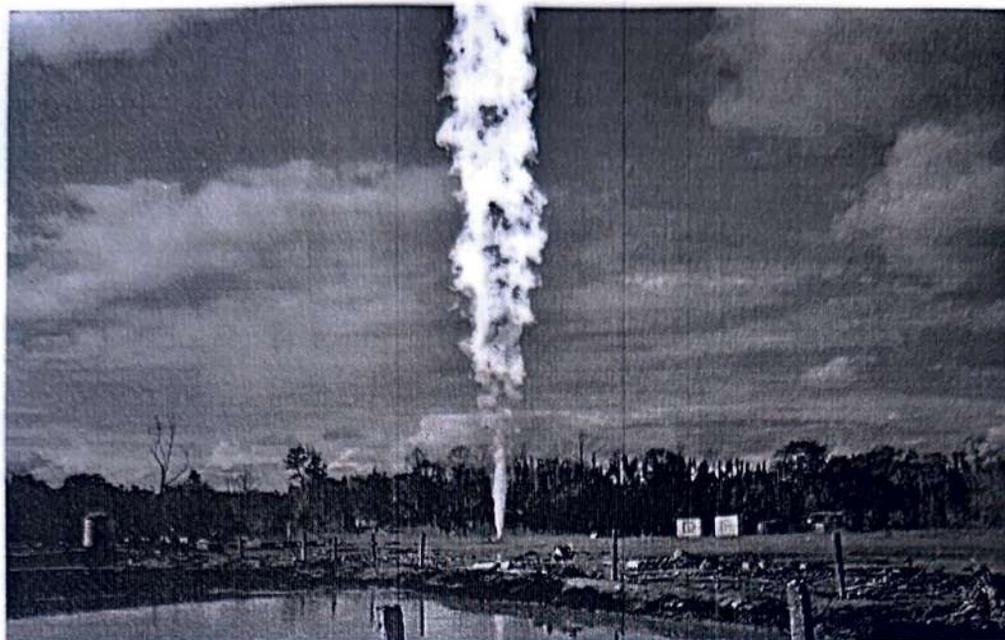
Well caught fire on 9th June, 2020



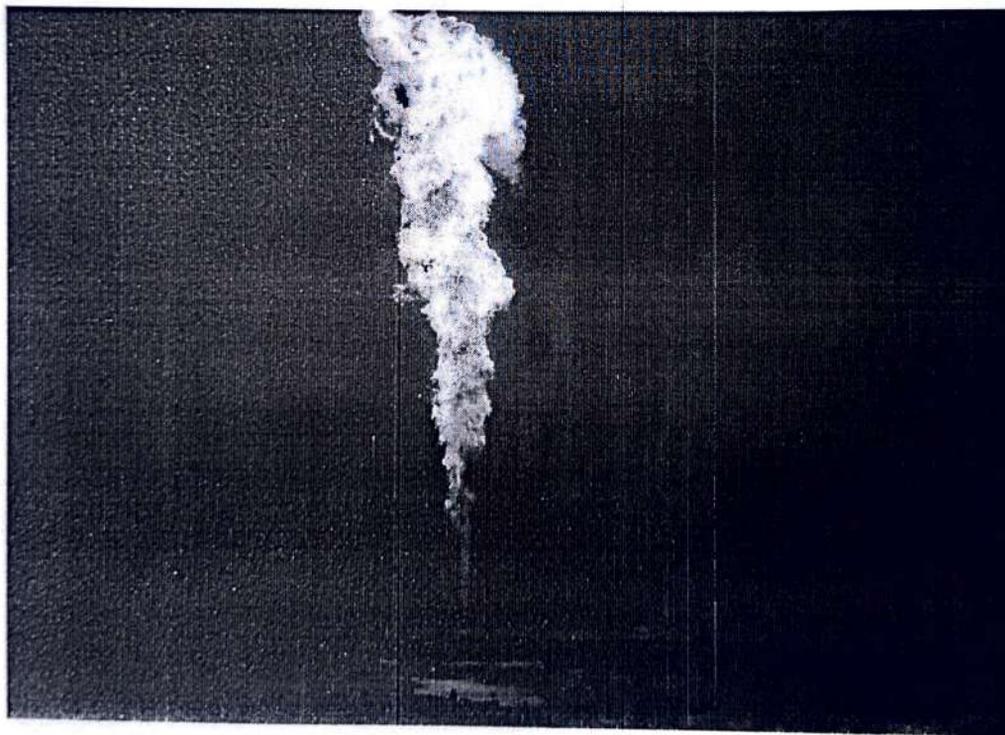
Search & rescue of missing fire personnel after well caught fire on 9th June, 2020



Rig debris after fire



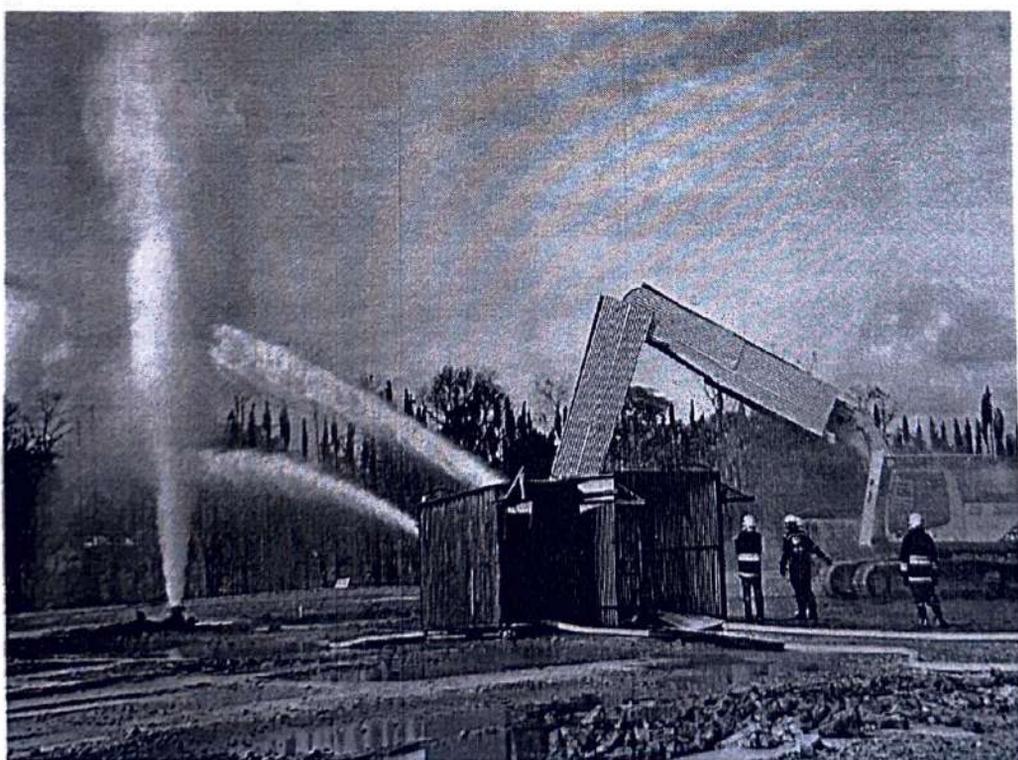
Well under fire (after removal of rig debris)



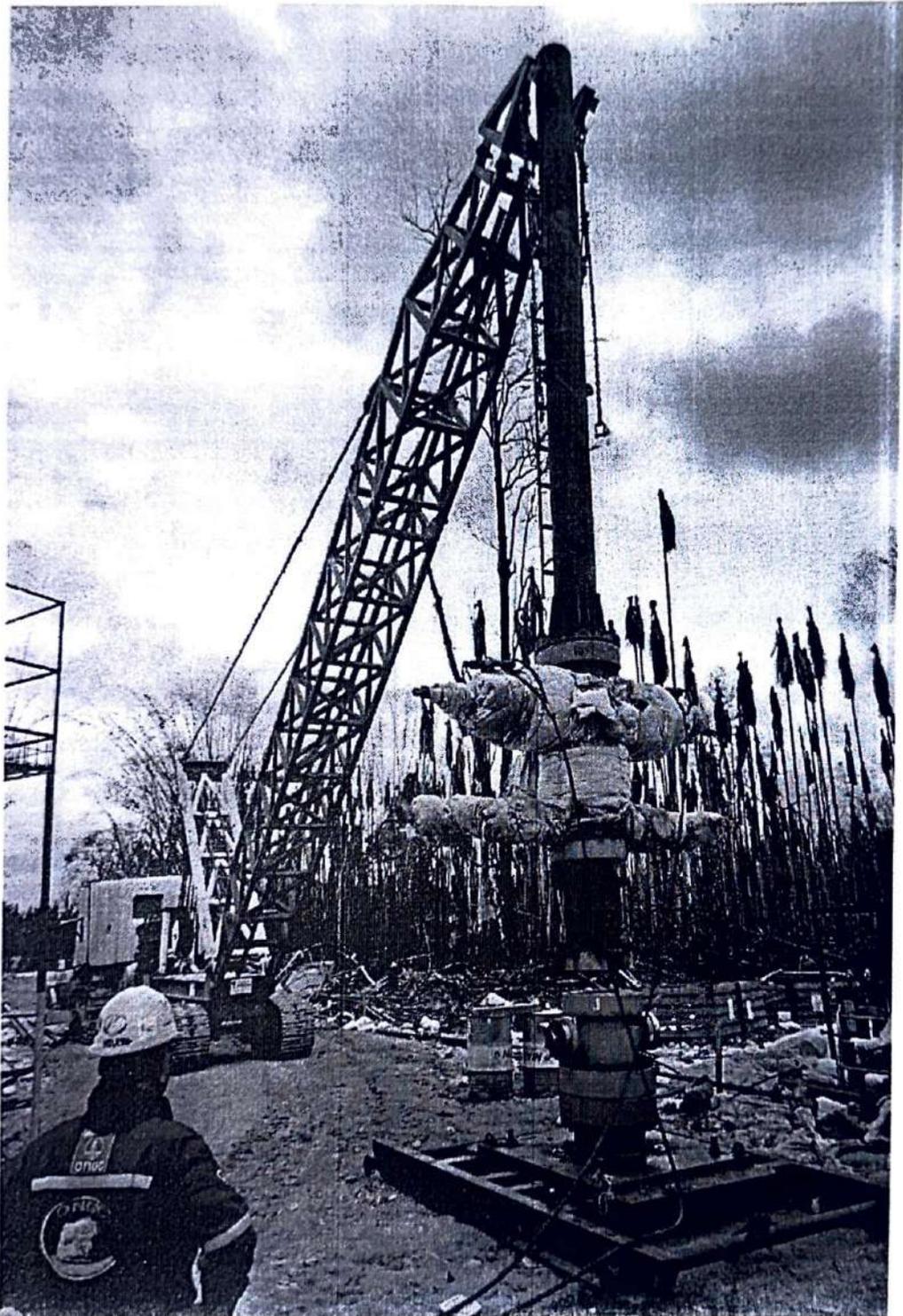
Well under fire (after removal of rig debris) – Night view showing enormity of fire



Well under fire (Cooling in progress, meanwhile making arrangements for well capping)



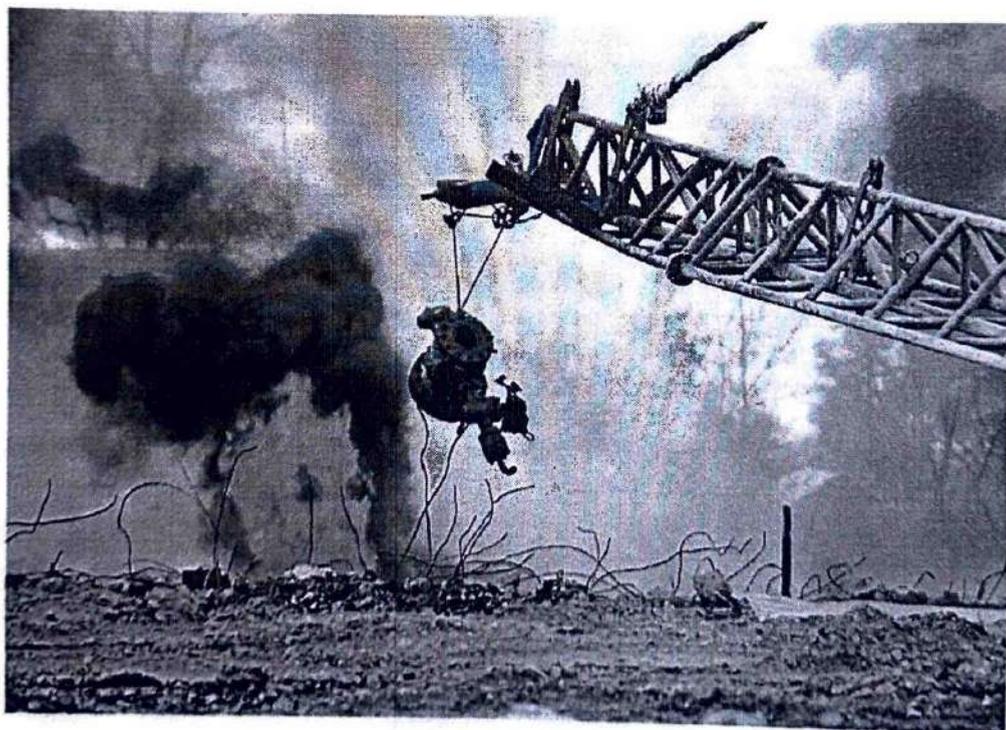
Well under fire (Cooling in progress, meanwhile making arrangements for well capping)



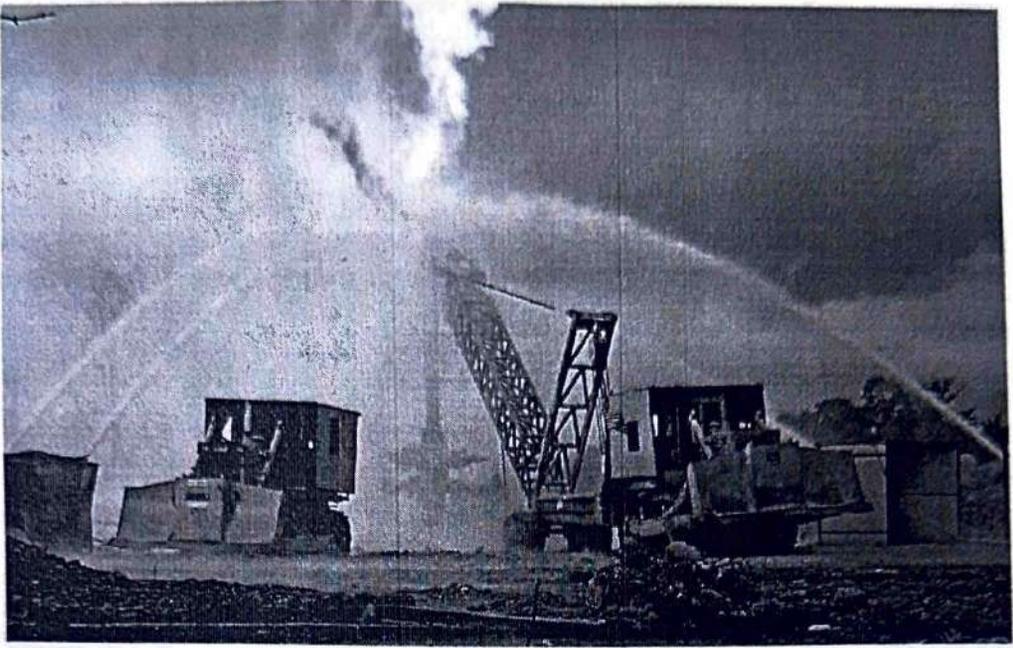
Athey Wagon at work - assembling BOP stack for capping



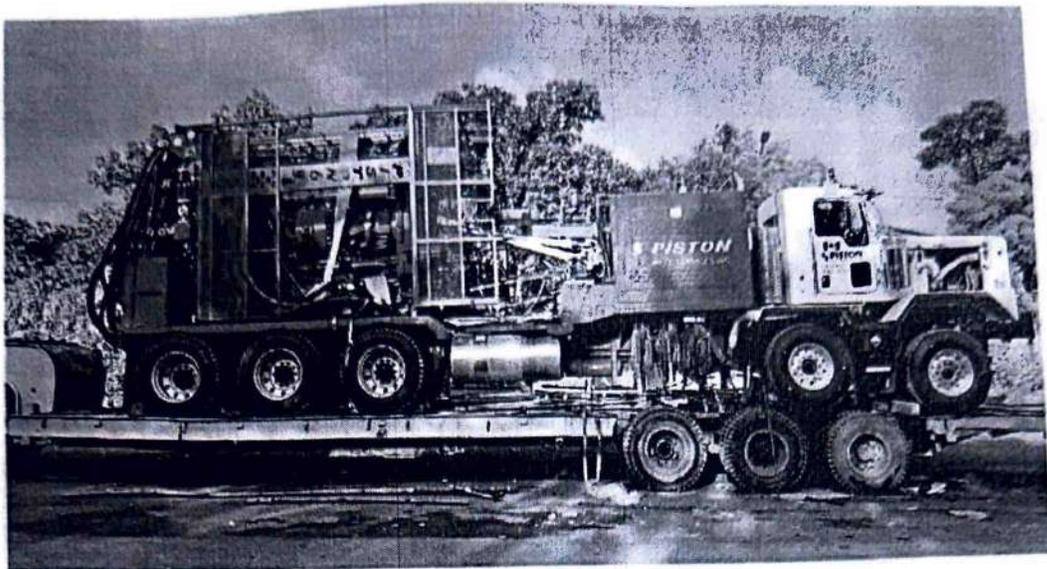
Well under fire (Cooling in progress, meanwhile making arrangements for well capping)



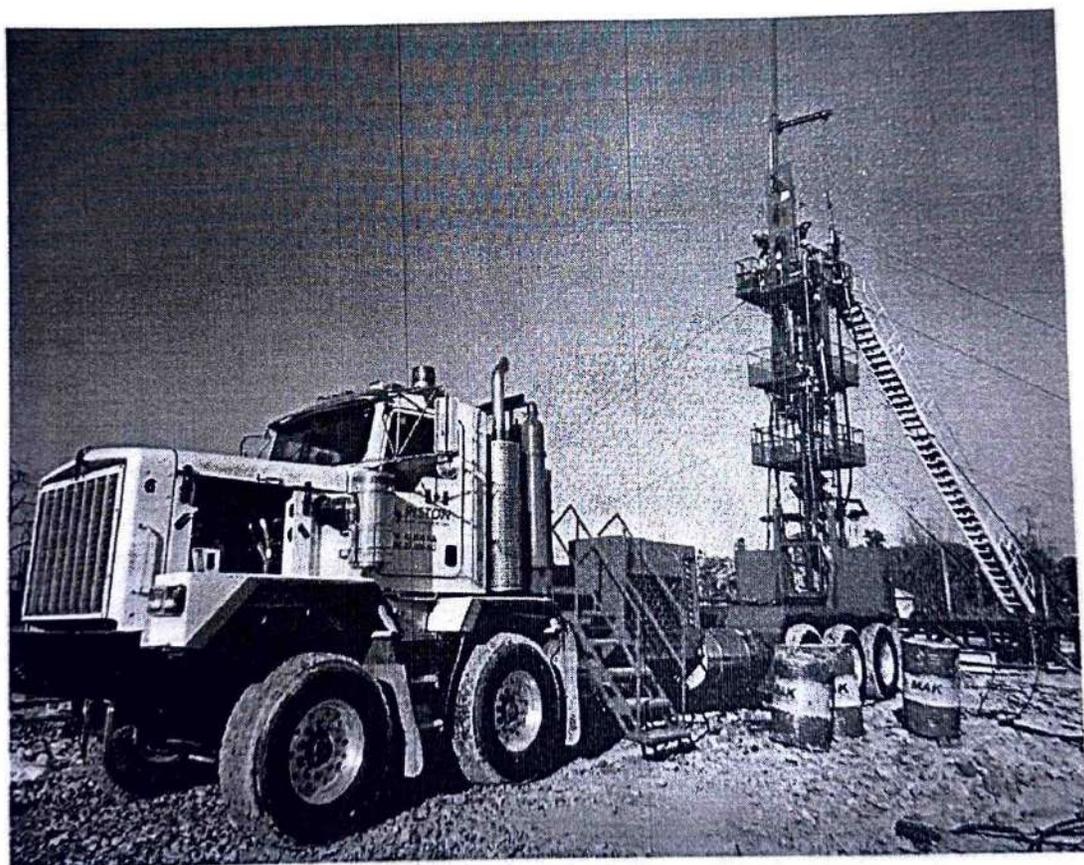
Well under fire (making arrangements for well killing)



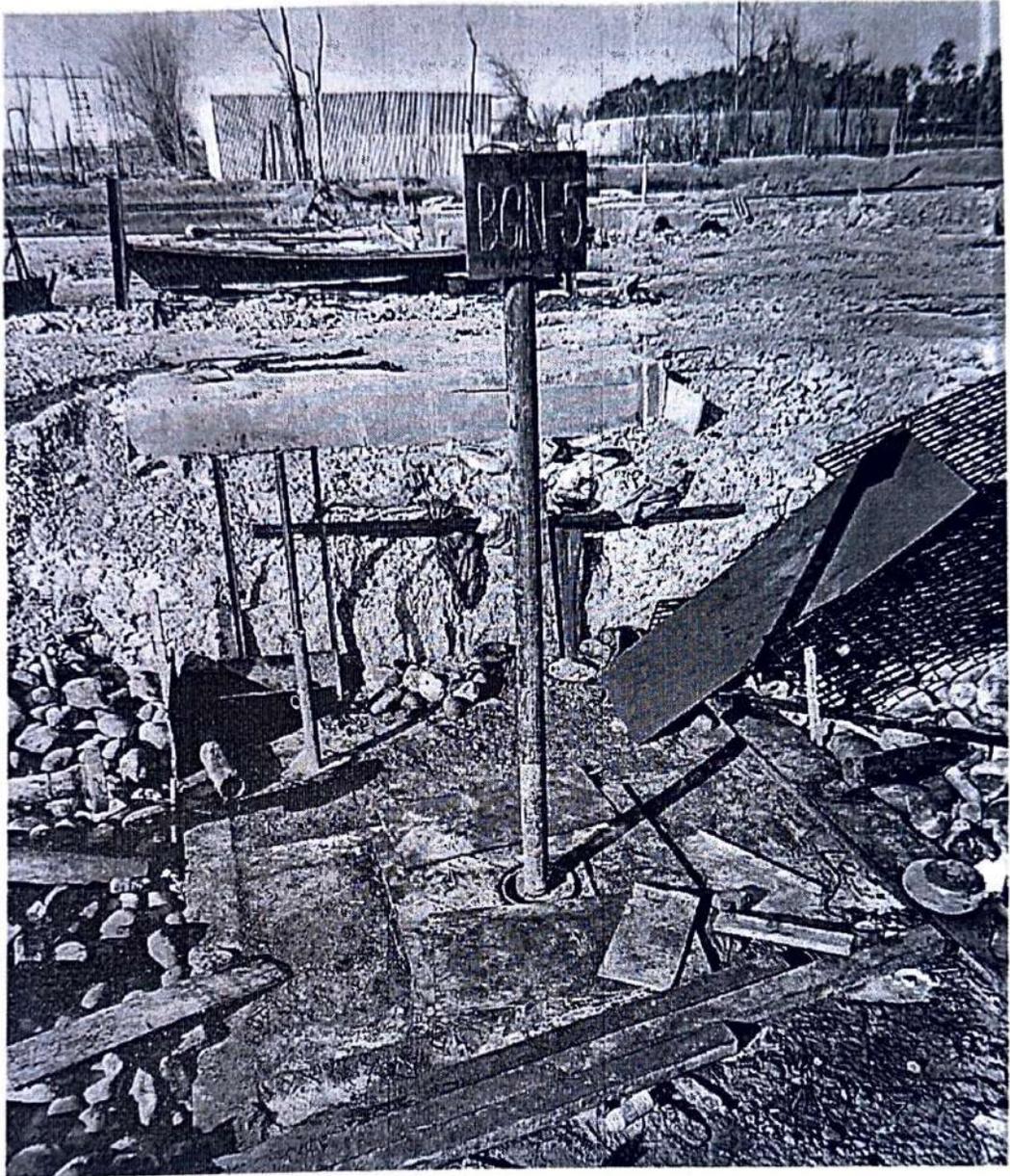
Well capped successfully on 17th August, 2020 in 3rd attempt



Snubbing Unit mobilized from Canada - under transportation for well killing



Snubbing unit rigged up for well killing



Well Baghjan#5 finally plugged and abandoned on 3rd December, 2020