



ALOP Claim following Damage to Air Pre-heater

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ALOP Claim following Damage to Air Pre-heater

Bhatawadekar & Co.

Since 1954

Milind Bhatawadekar

Bachelor of Engineering (Industrial Electronics)

1975-76 - Jr. Engineer in Digital Product Development

1976-77 - Jr. Engineer Power Electronics Equipment Mfg.

1977-80 - Shop Floor In-charge- Mech. Machine Shop.

1980-Today - Leads a team of 14 Engineers for Risk inspections & Large loss Assessments under Property, Project, Business interruption & Advance Loss of Profit Policies.

Extensive work in India, East Africa, Egypt, South-east Asia & ASEAN Countries.

The Power Plant

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- Anpara Power Plant is located near village Anpara about 200 km from Varanasi.
- 200 Kms from Varanasi take 8 hrs by car.
- Imagine the time taken when a large trailer has to navigate these roads.
- Kolkatta the nearest large airport- which can allow landing of heavy airplanes is about 750 Kms from power plant. Kolkatta has also a sea port
- Other sea port is Vaizag- about 1000 Kms away.

Anpara- Salient Details

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- Original Power plant belonged to local state Govt. owned utility.
- Lack of funds forced them to get the expansion- (2 x 600 MW) executed through an Independent Power plant under competitive bidding.
- This plant was scheduled to burn local coal- from Eastern coalfields which are about 100 Kms away.
- Revenue for the IPP is based on 2 part tariff:
 - (i) 100% of the approved fixed costs are reimbursed on reaching 80% cumulative Annual availability-of the certified plant capacity.

Details- continued...

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(ii) Variable costs are reimbursed on Normative basis- with heat rate cap on per KWH generated.

- Both these tariff components are only for 1100 MW capacity & the IPP is allowed to sale 100 MW on Merchant basis.
- This is allowed to be sold on 1/12th of the capacity made available on declaration basis every day.
- Insurance for the plant was organized under a Comprehensive Project Policy (MR wordings) Sum Insured US \$ 1 Billion & an ALOP policy with sum Insured of US \$ 120 million for each of the unit separately.

Project Status

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- At the time of claim- Unit I- boiler was under start-up with oil firing for its eventually transfer to coal. Unit II – commissioning was 8 months away.
- For ALOP policy- total sum insured of US \$ 240.00 Million- there was no project monitor appointed and Insurers did not know the exact status of the project and delays etc.
- This lack of knowledge did not eventually matter- as claim was during light up of boiler for the commissioning to achieve the COD.

Status continued...

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- COD of the plant can be declared when the plant proves the designated capacity (95% of the approved capacity) by running continuously for 72 hours at designed heat rate.
- Damage occurred during light up on **21.04.2013 at 17.30 hrs.** Scheduled date for the COD for Unit-I was 20.06.2011.
- The first light up of the boiler was on 19.03.2011.
- After this light up, a shutdown was taken- all issues were noted, attended, the Balance of Plant- particularly the Coal Mills- (4 of 8 for 2 units) were commissioned.

Claim – Circumstances

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- Boiler Light up- with Light Diesel Oil (LDO) was started at 05.25 Hrs on 21.04.2011.
- By 14.40 hrs, the Main steam pressure in the boiler had reached 22 Kg/Sq. Cm. 19 LDO guns were in operation by then.
- At such time Heavy Fuel Oil (HFO) was introduced in the burner guns.
- Slowly as the HFO feed (rate) was increased the LDO guns were withdrawn one by one.
- By 15.20 Hrs. 4 LDO & 2 HFO guns were alight.

Circumstances continued...

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- First indication of something amiss were seen in the form of black dense smoke from APH.

Time log:17.20 Hrs

- These being the signs of incomplete burning, checking for the APH internal was undertaken when fire/flames were observed.
- Simultaneously Fire Alarm was observed in control room.

Time log: 17.24 hrs.

- Emergency alarm was raised & feed was tripped

Time log:17.26 Hrs .

Circumstances continued...

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- Manual Fire Fighting Valve in APH top part was reportedly opened allowing water to be poured inside of the APH.

Time log: 17.27 hrs

- An explosion occurred in cold air duct drain pipe of the APH. Fire ball spewed out with high velocity and intensity.

Time Log: 17.35 hrs

- Two officials of the commissioning team were present near this area. One was singed badly & succumbed to injuries 10 days later.

Damage

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- The APH was totally destroyed/damaged. What was not damaged by fire was damaged by explosion, as few photographs in following slides will show.
- APH is a very large assembly and weighed **728 Tons**.
- Part of this is a rotor weighing **560 Tons**.
- Top of the assembly was at:
+ **20M** height from GL & **14 M** being the assembly height
Diameter of the APH was 13 M.

Photographs

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Since 1954



Photographs

Bhatawadekar & Co.

Since 1954



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Since 1954



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Photographs

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Since 1954



Photographs

Bhatawadekar & Co.
Since 1954



Issues & Challenges

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- Issues in repairs & recognizing of a large & difficult claim started with no project monitoring report.
- Another adjuster was appointed to assess the Material Damage loss.
- After his site visit he reported that there was no possibility of the ALOP claim being triggered as:
 - (i) COD could not have been declared and unit could not have started commercial operations due to there being no coal stock available.

Issues...

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Since 1954

- (ii) Coal Mills were not ready- fully commissioned.
- (iii) The coal conveying rail branch line being not ready to convey the coal to site from the mine pit head.
- These were perceptions & were proven wrong.
- 80,000 Tons of coal was already at site & more was being conveyed every day, the rail branch line was fully commissioned and ready to use & the 4 coal mills (out of 8) were capable of delivering full coal crushing requirements of one unit.

Issues...

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- The Insurers acknowledged that an ALOP claim would trigger about 1 month after the loss.
- Any efforts for early reinstatement to save the period of interruption thus started only thereafter.
- All the decision making was post our first visit to site.

Challenges : Space

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- Structures for APH assembly were integral to the boiler structure.
- Equipment in the vicinity : flue gas piping, 2nd APH, auxiliaries & Control room building for both the Units did not allow access to damaged APH from any side for dismantling/erection.
- There was no space available to move/position/erect/operate cranes, winches or other such common lifting equipment within, below or near APH area.

Challenges : Manufacturing

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- All major and critical components had long lead times for manufacturing and delivery from OEM's works in China.
- Delivery period quoted was in excess of 240 days for the last part of the assembly to be delivered- ex works China.
- There was no indigenous component in total of the 780 Tons of manufactured components.
- Apart from APH there were a lot of other associated parts needing dismantling and re-erection- weighing about 150 Tons.

Challenges : Logistics

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- All critical parts were ODC/OWC consignments and were to be delivered in India during peak monsoon season, when the road conditions are predictably bad.
- Even during the best of the times- summer the roads are bad, they become worse in monsoon and post monsoon periods.
- On way to Anpara there is one bridge which is so vulnerable that the cargo has to be taken on river bed only when the bed is dry. Till then the trailers just wait at the banks.

Challenges : Logistics & Erection

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- As mentioned earlier this project was an IPP adjoining an existing the state owned power plant.
- To ensure arms length working- a high wall was built separating both the boundary premises thereby giving only single access road to the project site.
- Construction of control room- a permanent structure and cable galleries and the boundary wall etc. meant that the approach road to the location was very narrow and congested and needed careful planning.

Challenges : Erection

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- Originally the APH was erected using cranes.
- This was no more feasible due to space and access constraints, change in sequence of delivery of components and non-suitability of normal lifting tools/ equipment.
- Just adequate opening was available to manoeuvre & lift the APH components, to assemble them in situ and complete the erection.

Schedule & Claim

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- The schedule drawn immediately after the loss & presented to us at the time of first visit showed the period of completion of all the jobs & to come back to original state just before the loss, was for 323 days.
- This meant that the ALOP claim- based on the sum Insured would of the order of US \$ 100.00 Million.

Overcoming the Challenges

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- Space Constraints at site were attacked first, as these were the first stare in face.
- After gas cutting the APH assembly and allowing to fall below- it was noted that the trailer access space was likely to become a major issue.
- Some of the structures coming in way were cut, mock assembly – having same diameter as the APH highest OD was fabricated and the trailer path and travails were charted out well.

Challenges continued...

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Since 1954

- To enable APH erection work within the available area, strand jack system mounted on gantry was designed and put to use.
- The strand jack/ gantry system was mounted on the available boiler structural steel framework after necessary structural analysis and strengthening in consultation with boiler OEM. The efficacy of such strand jack system was checked and tuned during dismantling of damaged APH so that its usage in erection was optimized.

Challenges continued...

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Since 1954

- **Strand jack/Gantry arrangement:**

The system consisted of two hydraulic strand jacks with individual power packs. Total lifting capacity of jacks was 75 MT. The strand jacks were mounted on a gantry, which could be moved on rails using winch across the working area as shown below. Rails were welded on available structural steel framework after necessary structural analysis and strengthening. Materials were unloaded and moved inside the working area, from where they were directly lifted and positioned and assembled using strand jacks.

Challenges continued...

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Since 1954

- The strand jacks were used for vertical movement of materials while the rails on which the strand jacks were mounted facilitated horizontal movement of the materials.
- This would not have been possible with crane or winch due to lack of access from top and the sides for usage of crane and winch.
- Prior to this Hydraulic scissors tables were also contemplated and rejected being long delivery item as also technically not as suitable as strand jacks.
- With this arrangement 30 days from the schedule of 323 days were cut off.

Challenges continued...

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Since 1954

- After discussions with Insured and their EPC Contractor's planning, logistics and project management teams, we approached OEM in China and offered incentives.
- It helped that we had visited them earlier for another claim and they knew that we could take decisions on behalf of all concerned.
- Suppliers brought forward delivery of parts without written confirmation. The work was sub contracted to Submarine manufacturing yard to expedite the delivery. We could judge that the material will be delivered and hence logistics will need to be modified to address the issues arising out of it.

Challenges continued...

Bhatawadekar & Co.
Since 1954

- Strand jack usage had brought the schedule to 293 days.
- Visit to China- confirmed that the period of delivery could be brought down by 60 days.
- Now optimizing the transport was warranted. Initial schedule included only 2 air shipments.
- With the revised schedule this was quickly changed to 8 air charters. The only aircraft capable of handling both the size and weight is highly in demand- AN 27.

Challenges continued...

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Since 1954

- This was booked for a continuous and long period to make to & fro trips to Kolkatta. 8 air charter flights were used.
- Sequence of erection and based on this the sequence of air charter and based on that manufacturing & delivery of components was fine tuned.
- The fact that only small aperture was available for erection ensured that no single component could weigh more than 50 Tons.
- This also meant that very heavy duty trailers were not required for transporting these to site.

Challenges continued...

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Since 1954

- This was blessings in disguise as the bridges on way did not offer any new challenge.
- Package size limitations were also determined by the aircraft opening, to admit the package inside its belly.
- Specialized agencies were allowed to be deployed both in China and in Kolkatta for loading /unloading and escorting the cargo to site.
- All these decisions were taken by the undersigned loss adjuster and his team - virtually at site, in China as & when required.

Challenges continued...

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Since 1954

- All preparatory measures (at site, packing/lashing, transportation, customs clearance, handling etc.) were planned to the last detail well in advance and their progress monitored closely.
- Customs clearances were fast tracked and closely coordinated.
- We had cautioned Insured to ensure that the cargo should not wait at airport for even a day for customs clearance.
- Payment of additional charges (official provisions in customs act) to customs department for holiday working and clearance without inspection was cleared.

Challenges continued...

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Since 1954

- Erection sequence and schedule was customised based on material availability, space constraints and available tooling/infrastructure, possible overlapping and simultaneous onsite and offsite works.
- Difficulties faced using strand jack system during dismantling, allowed the system optimisation for re-erection of APH components.
- The initial estimate of 323 days for smoking chimney to smoking chimney was brought down to 195 days by all these measures.

Additional Benefits

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- I used the phrase-smoking chimney to smoking chimney, as that was the period of repairs and coming back to the boiler reaching the pre-damage pressure of say 22Kg/Sq. Cm.
- However as the repairs to Unit I were ongoing many systems/subsystems of the BOP- which were ready at the time of loss, but may have had some niggling issues- were perfected by the time the Unit I came for COD again.
- From boiler light up till declaration of COD the process was completed in less than 30 days against earlier 60 days planned.

Closure of Claim

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Since 1954

- What started as 323 day estimated interruption for ALOP claim with the loss amount of US \$100 million was closed with the interruption period of just **166 days**- with the 30 day deductible to be adjusted further.
- The actual loss amount is not yet closed as the policy warrants that *“the results of the business insured for 12 months period after the date of commencement of business insured”* be taken into consideration.

Closure of Claim

Bhatawadekar & Co.
Since 1954

- Unfortunately there was a “rotor earth fault” which kept the unit out of working for more than 3 months.
- Rotor earth fault was attributed to human error.-
- Discussions are still on as to whether one can say “either way” that had the APH claim not occurred the rotor earth fault might not have occurred.
- We expect to close out the claim at about US \$ 35 **million**- at 2011 conversion rate.

Lessons Learnt

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Since 1954

- Critical lesson learnt- not only from this claim but my earlier experiences of few other claims, on Chinese equipment:
-

- *LP rotor of 300 MW TG repaired in 18 days,*
 - *Generator rotor of 135 MW machine delivered within 28 days*
 - *This claim 780 Tons material fabricated and delivered in 120 days and then installed and in situ machined to limit the interruption to 166 days-*
-

Is that you chase them and they almost make impossible things possible.

Lessons learnt

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Since 1954

- Only caveat to this is- that Chinese must see you as person in control & command.
- Following a claim you must seem to be the one who drives the decision.
- This freedom was allowed and we could take spot decisions without referral to Insurers for approving the costs. Experts were of our choice but working under our control.
- Less meetings and more ground work was the way to cut the time lines.

Epilogue

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Since 1954

- Appreciate that the real good work is never done by team of large continent of independent experts, but it is achieved by a hardworking lone ranger leading a competent team.