

Humber Refinery.

- ? On April 16th 2001 at approx 14.20hrs a pipe failed leaking, Liquid LPG out of a 6inch pipe line.
- ? An Explosion occurred when the LPG got into a heater, some 45mtrs away.
- ? The following shows the extent of the damaged caused.
- ? Fire was declared out at 17.10hrs.

April 16th 2001 Gas Plant Blast



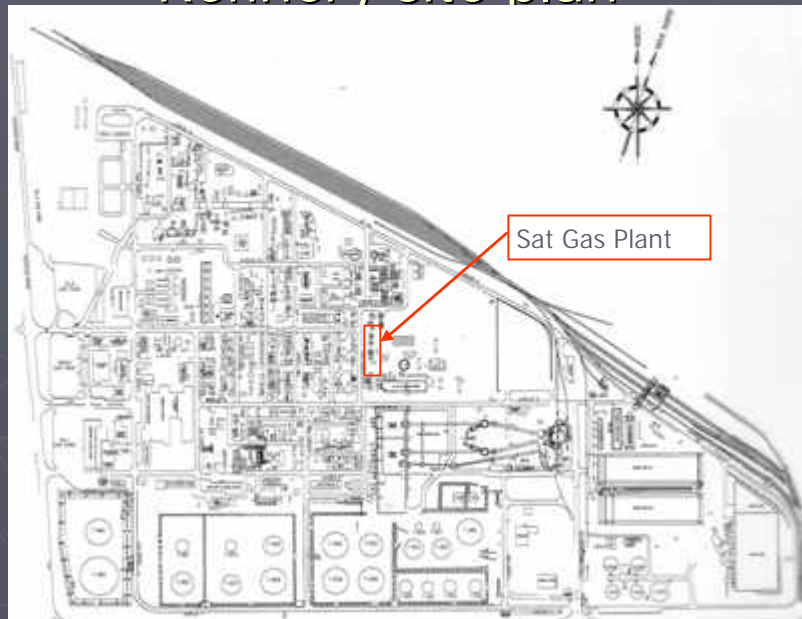
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Final Blast est. to have gone 120 to 150mtrs into the air.

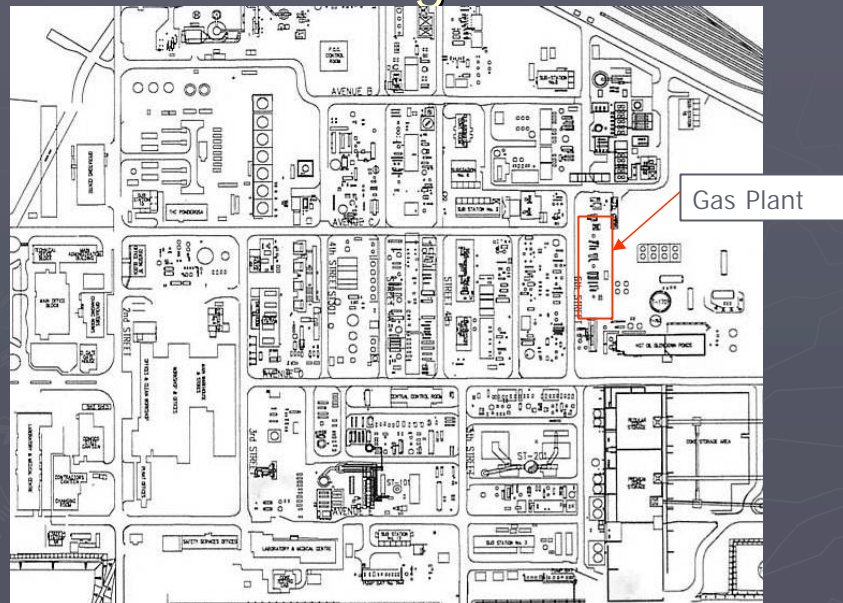


Refinery site plan

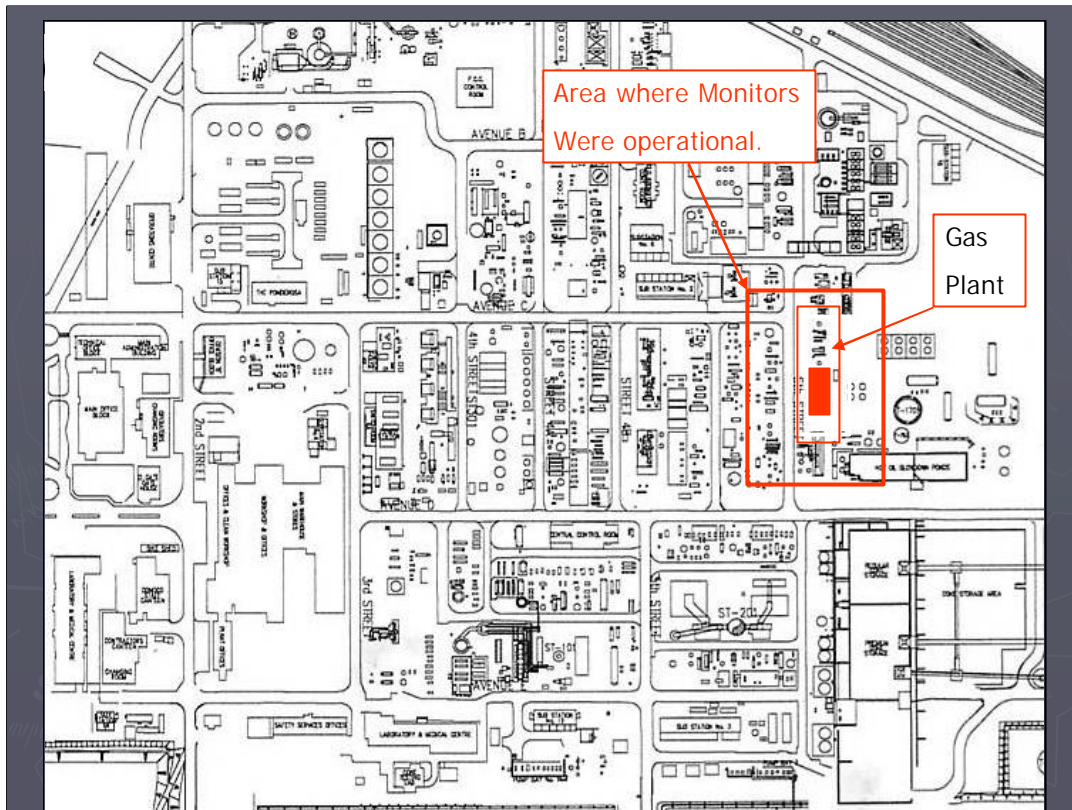


The gas plant is to the North side of the refinery. To the East side of the unit is mainly open ground towards the flare stack.

Main Damage Area



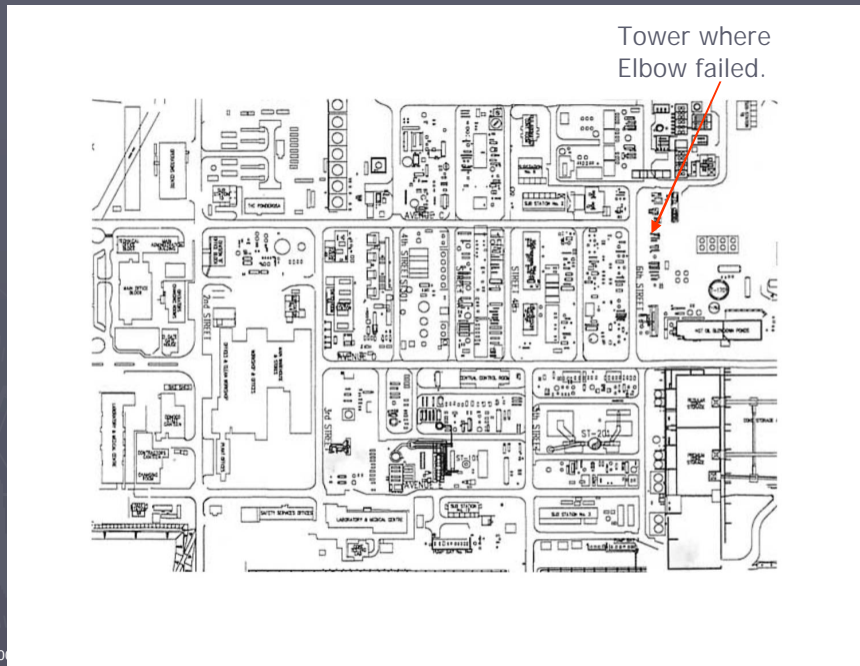
This is the area where most of the damage occurred. This covered buildings such as substations and pump houses.



When I arrived on scene in the outer area marked, was where the operations and our fire crews had got turret and trailer monitors to work. They had also operated pump drenchers on the a joining units where possible, which told me the size of the area first covered by the fire.

The red box was the area on fire when I arrived on scene. I asked operators and fire crews to shut down any equipment that was not required.

Because the monitors were not quite reaching into the fire, I requested one of our 2000gpm monitors to be brought in and set up. When operational, water reached into the centre of the fire.



Here is the layout of the unit areas with the tower pointed out where the elbow failed.

Elbow that failed.



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View looking up from the ground towards the tower showing the failed elbow.

Failed
Elbow.



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Another view of failed elbow looking towards the East.

? Gas Plant.
Pipe failed
off Tower
on right.



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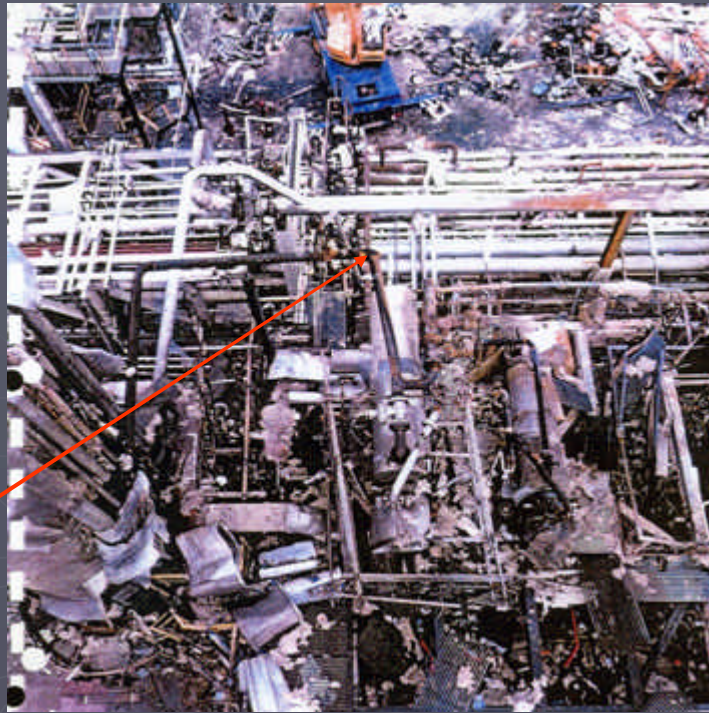
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This is a view of the gas plant looking towards the west showing the three main towers on the gas plant

View from
above.

Failed
Elbow.

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This is a view from above the unit where the elbow failed. Crane was moved into area after the blast.

An other view of Gas Plant



This unit was being got ready for a planned shutdown. Here you can see the scaffolding on one of the towers.

ConocoPhillips

View
looking
South

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This is a view looking south over the top of the pipe rack which is on the East side of the Gas Plant.

? This is the inside of the heater where the LPG leak found its ignition source.



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This is a view into the heater where it is suspected the LPG found its ignition source.

? Closed
Blow Down
Area to
South off
LPG Main
Leak.

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This is a view to the south through the closed blow down area. See to the left of the picture the inside remains of one of the unit fin fans.

Remains of a Fin Fan Closed Blow down



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Another view through the closed blow down area.

? Insulation
stripped from
two towers
caused by the
blast.

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Two towers in the area with the insulation stripped of by the blast.

Probably the last elbow that failed.



This was most likely the elbow that failed giving the biggest explosion. Once this failed it would have emptied all the LPG from out of the tower just to the left.

? Most likely the last pipe that failed.

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View of the failed pipe.

View of
elbow
that
emptied
tower



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This is another view from above looking down onto what was most likely the last pipe to fail. With this failing all the LPG will have been released from the tower.

- T1701 Water Tank. Note Burn marks where Tank has been on Fire



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This is the tank that all the water from the coke drums comes to separate the water from any oil. The tank had a floating roof and we had a rim seal fire.

? Tower
blown
over.
25mtrs
from Gas
Plant.

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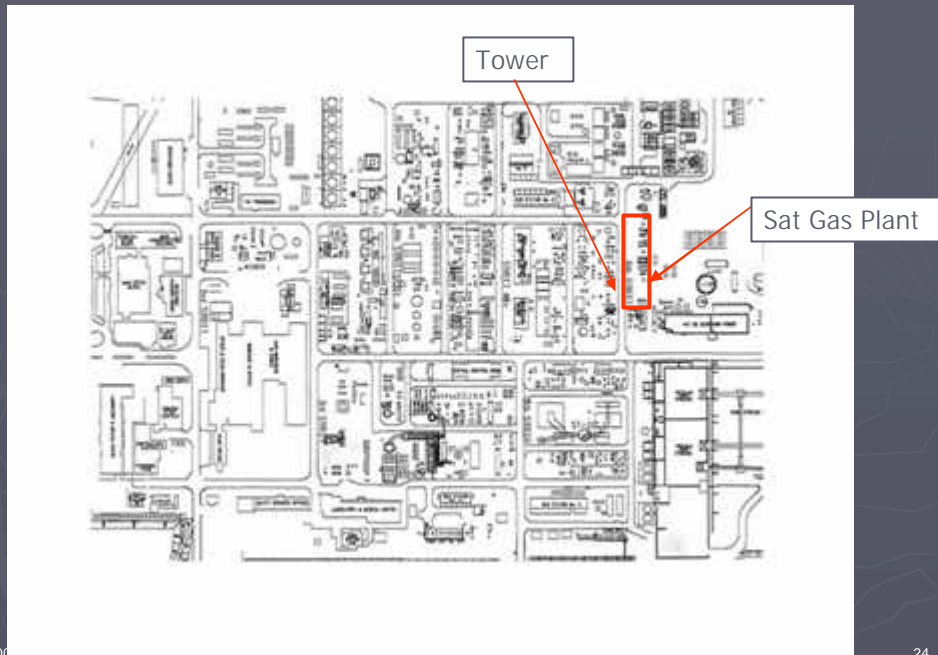
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This is a view from the gas plant looking towards the west. The tower was a new one being installed and was only bolted to the ground.



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Second view of tower leaning. (Taken from HSE document)



View of the location of the tower to the gas plant

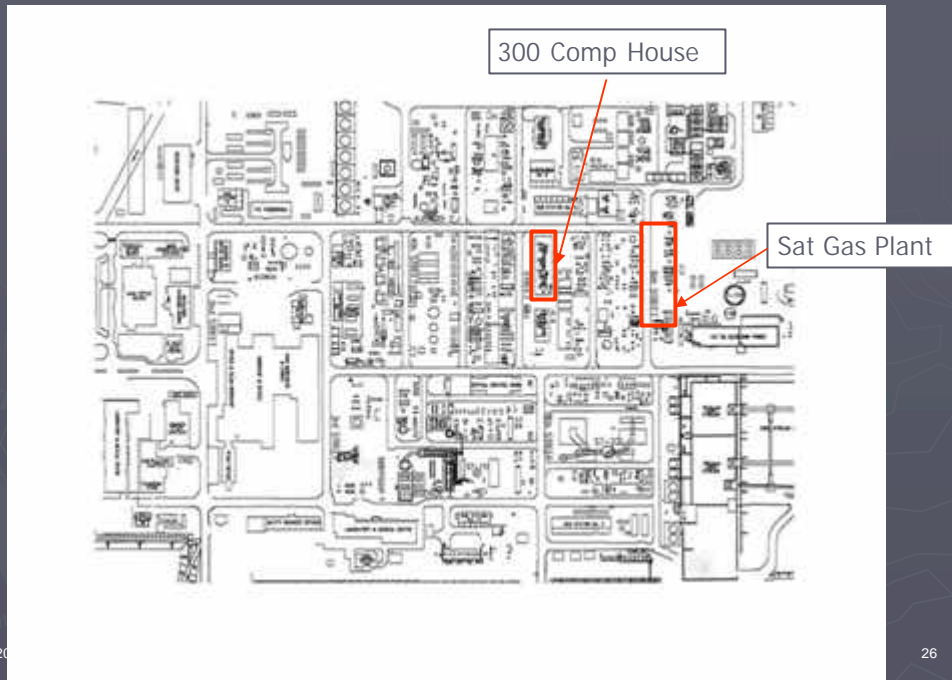
? 300
Compressor
House approx
120mtrs from
Elbow that
failed and
resulting Blast



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This is a view of the remains of the Compressor house building and roof. The sheets from the roof and walls were all broken.



View of location of Compressor house to the gas plant.

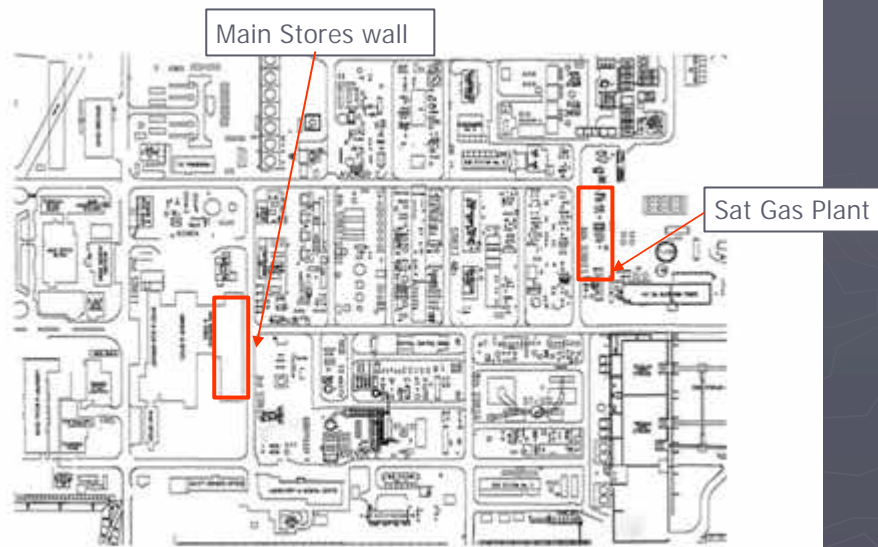
? Stores
Wall 3rd
St. approx
300mtrs
from Blast
Area.



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This is a view of the wall on the main stores. This side of the building was towards the blast area, although there was much plant between it and the blast area.



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Here you can see the distance between the stores and the Gas Plant.

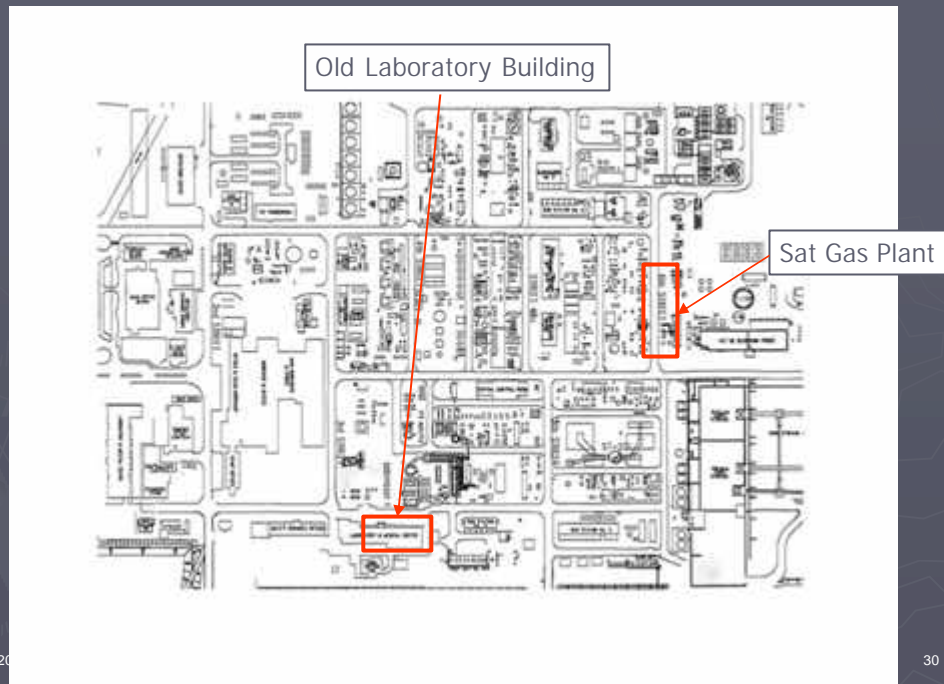
? Lab Building
Ave E.
Approx
300mtrs
from Blast
Area. All
windows
out.

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This is a view of the lab front. The window at the left went in and the others came out.



View of location of the Lab to the Gas plant.

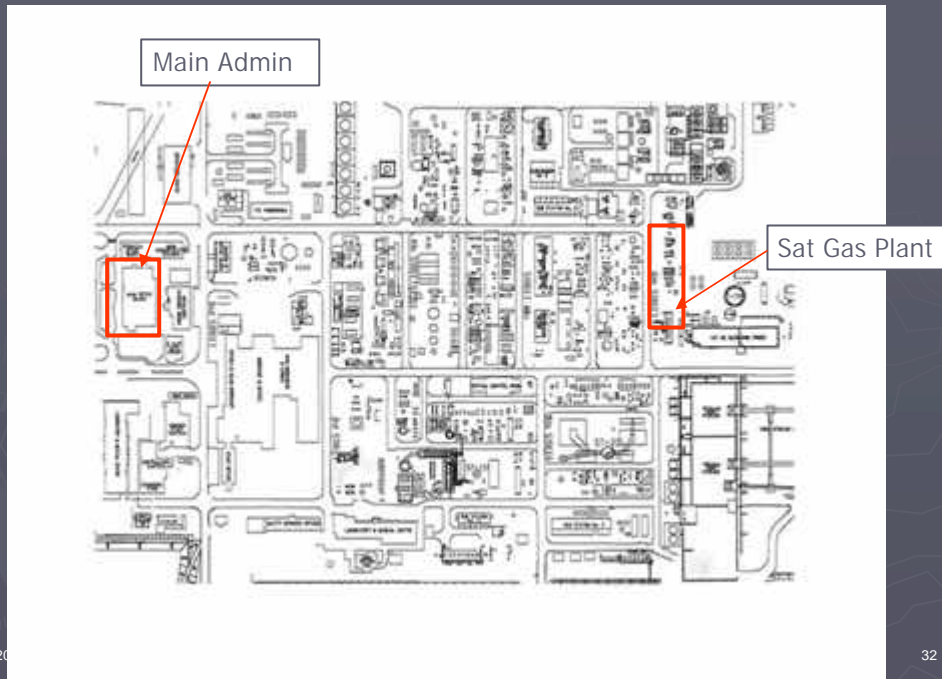
? Main Admin
Quadrangle.
Approx
425mtrs
from Blast
Area.



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This is in the main Admin building. As can be seen the ceiling has all fallen in and the windows along the side have all been broken.



View showing location of the admin building to the gas plant.

- ? Thanks for your attendance and interest.
- ? And one last comment?

? I can take any questions on the fire fighting only, and will do my best to answer them.

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There is one last thing I would like to say to you all.

I joined the Local fire service back in 1967. All through my time both with the fire service and when I moved into industry, I can remember being told, "If you have a fire involving LPG vessels make sure you keep the vessels cool so as to help prevent a "BLEVE"."

I do not have the CCTV video to hand but I can remember watching it and counting 2 major BLEVE's and 3 smaller one's.

What I can tell you is that not one vessel ruptured, but many pipes did.

What I say to you all is, "Make sure you cool all the pipes in the fire area as well."

Thanks.