

CASE STUDY – Development of Five Office Blocks adjacent to an existing High Pressure Pipeline.

The case study concerns the development of five office buildings near an existing buried pipeline. The pipeline was originally routed through open countryside, but the area around this part of the route is now developing as an industrial area, with factories and offices each side of the pipeline.

A developer proposes 5 new office buildings to be built near a roundabout as shown below in the green area. The pipeline route is shown in red.



Five office blocks are proposed, each designed for up to 30 occupants.



The pipeline is a Major Accident Hazard Pipeline with a consultation distance of 250 metres. The new office buildings are all located within 60 metres of the pipeline, the closest being 5 metres away.

The local planning authority therefore consults PADHI – the HSE's Planning Advice for Developments near Hazardous Installations. The relevant part of the guide is shown below:-

DT1.1 - WORKPLACES	Offices, factories, warehouses, haulage depots, farm buildings, non-retail markets, builder's yards.	Workplaces (predominantly non-retail), providing for less than 100 occupants in each building and less than 3 occupied storeys – Level 1	Places where the occupants will be fit and healthy, and could be organised easily for emergency action. Members of the public will not be present or will be present in very small numbers and for a short time.
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Because each office building contains less than 100 occupants and has less than 3 occupied storeys, the Sensitivity Level is Level 1, even though the total number of occupants in all 5 buildings could be 150.

The decision matrix from PADHI is therefore Don't Advise Against.

Level of Sensitivity	Development in Inner Zone	Development in Middle Zone	Development in Outer Zone
1	DAA	DAA	DAA
2	AA	DAA	DAA
3	AA	AA	DAA
4	AA	AA	AA

DAA = Don't Advise Against development.

AA = Advise Against development.

The local planning authority therefore granted planning permission, and the developer commenced construction. The pipeline operator was not informed.

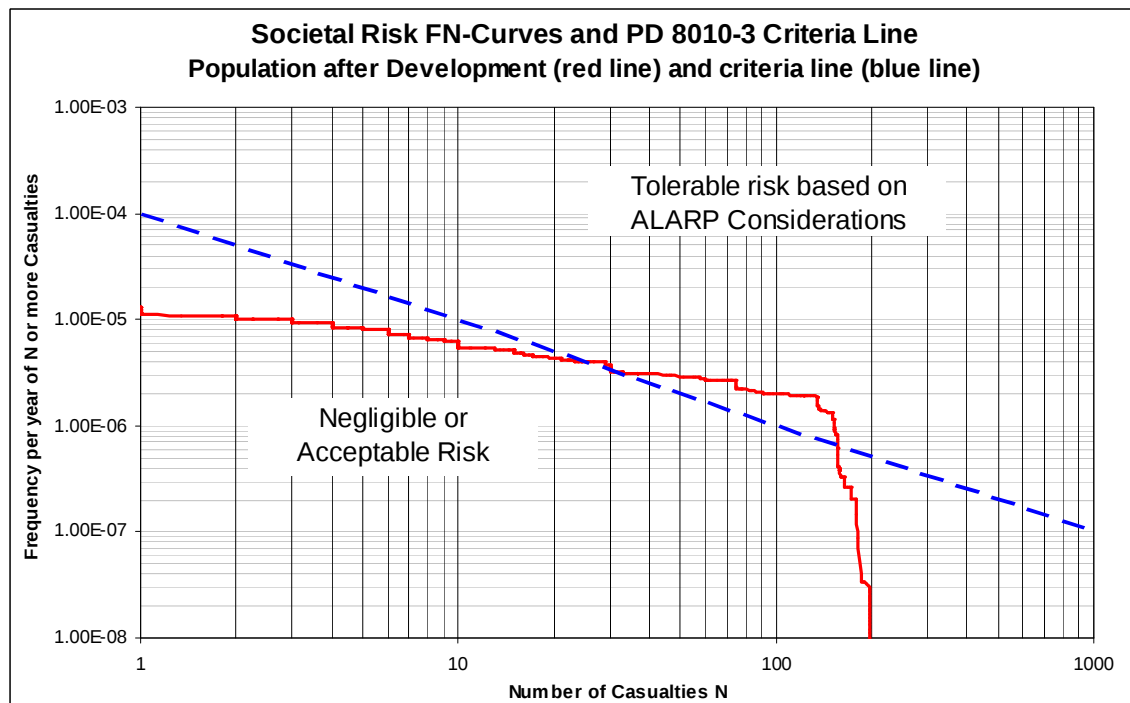
During the regular pipeline surveillance of this part of the pipeline, the operator discovered that construction was taking place near his pipeline. When he realised the extent of the development, he commissioned a societal risk study of the effect of the additional population close to his pipeline.

A survey of existing population near the pipeline was carried out and the location relative to the pipeline route plotted in 25m squares, as shown below. The red line at the centre of the plot represents the pipeline. Two plots were considered, one for daytime population and the other for nighttime.

“Guide to the application of pipeline risk assessment to proposed developments in the vicinity of major hazard pipelines containing flammables” – Supplement to PD 8010-1:2004, British Standards Institution.

The lower part represents the acceptable risk region, and the upper part is the ALARP (as low as is reasonably practicable) region, and therefore requires consideration of cost-effective risk reduction measures. The actual risk (red line) is all within the acceptable region, therefore the risk is acceptable.

The additional population in the proposed new offices is now added to plot, and the societal risk re-calculated.

[illegible]

The risk now exceeds the criteria line and therefore risk reduction measures should be considered to reduce the risk to the occupants of the offices.

However, the developer goes ahead and builds the first of the office blocks adjacent to the pipeline.

The pipeline operator therefore considers how he can reduce the risk. The main risk is from unauthorised 3rd party excavation of the pipeline. Therefore the operator installs extra warning signs along the route of the pipeline, and plans to install additional fencing along this section of the pipeline route.

Also, the pipeline operator decides to carry out more frequent surveillance of this part of the pipeline route so that any unauthorised excavation work can be identified and stopped before damaging the pipeline.

For the occupants of the offices. extra emergency instructions are proposed, so that in the event of a leak from the pipeline, the buildings can be rapidly evacuated.



The red marker post indicates the route of the pipeline.

The main lesson from this case study is that the pipeline operators should be kept informed of significant developments within the consultation distance from major accident hazard pipelines so that they can comment on the impact of extra population near their pipelines, and suggest possible changes to make the risk more acceptable

If the development had been moved 50 metres further away from the pipeline (still within the consultation distance), the risk would have been acceptable:-

[illegible]