

CHAPTER 10**SECTION 7****QUANTITY DISTANCES FOR MUTUALLY HAZARDOUS AND OTHER NON-EXPLOSIVES BUILDINGS AND FACILITIES IN RELATION TO POTENTIAL EXPLOSION SITES****CONTENTS**

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1 SECTION SEVEN

1.1 Introduction

1.1.1 The QDs given in other sections of this chapter are the normal minimum requirements to ensure a high degree of safety for persons and property from PES. However, certain buildings, installations and facilities, or their use, may hazard PES. Conversely, some facilities may require additional protection from an explosive event at a PES. The following paragraphs detail the normal QDs and the structural measures to be observed to safeguard PES, or to provide protection to a building, installation or facility, as an ES, from the effects of an explosive event at a PES. The QDs specified below are tabulated at Annex A.

2 APPLICABILITY

2.1 General

2.1.1 The distances quoted are to be applied to all PES licensed in accordance with Chapter 10, Sections 2, 3, 5 and 6. For naval or military ports, see Chapter 10 Section 4, and for Limited Quantities, see Chapter 10, Section 8.

2.2 Existing Facilities

2.2.1 Unless specifically stated in the following paragraphs, none of the facilities listed below are normally to be sited in, or in the vicinity of, explosives storage facilities including those sited on airfields.

2.3 New Facilities

2.3.1 For all new planning, the minimum QD below are to be applied. Departures from these are only permitted for sound operational reasons, and are to be reflected in the Siting Board findings and on the Explosives Licence. The decision as to whether the operational requirement dictates that the facility may be within the recommended distance is to be given by the appropriate IE in consultation with CIE(MOD) staff.

3 BULK LIQUID FUELS, OIL, LIQUID OXYGEN AND LPG INSTALLATIONS AND STORAGE (INCLUDING PACKED STOCKS)

3.1 Introduction

3.1.1 Installations and compounds for the storage of bulk stocks of liquid fuels and oils (including packed stocks), liquid oxygen (LOX) and liquid petroleum gas (LPG) are not normally to be constructed within explosives facilities and, wherever possible, should not be constructed in their vicinity. When the construction of installations and/or compounds in the vicinity is unavoidable, the advice of the Fire Focal Point should be sought to decide any extra safety precautions to be applied, but, in any event, the following QD are to be observed:

- (1) Unprotected Above Ground. Unprotected aboveground installations and storage compounds are to be separated from PES containing HD 1.1, HD 1.2 and HD 1.3 by the appropriate IBD in the tables in Chapter 10, Section 2, Annex A, with the applicable minima. For HD 1.4, a minimum separation distance of 25 m is to be applied.
- (2) Protected Above Ground and Underground. Above ground and underground installations protected against blast and fragmentation penetration in accordance with para 3.2.1 are to be sited, for HD 1.1 explosives, at half the D7 distance ($1.2Q^{1/3}$) given in Chapter 10 Section 2, Annex A, Table 1A-D, with a minimum distance of 25 m. For HD 1.2, HD 1.3 and HD 1.4 explosives, a minimum separation distance of 25 m is to be maintained.

3.2 Constructional Requirements

3.2.1 The minimum protective requirements for liquid fuel, oil and LOX installations located within the immediate vicinity of explosives areas are as follows:

- (1) Above Ground. Above ground installations are to be surrounded by retaining walls of bricks, concrete or earth capable of containing the complete contents of the installation, plus 10%.
- (2) Protected Above Ground. The structural protection required for above ground installations to be considered for the reduced QD at sub-para 3.1.1(2) is that, as an ES, it is provided with structural protection equivalent to a heavy walled building with a robust RC roof of at least 150 mm thickness, as shown in the ES column, row 9 of Chapter 10, Section 2, Annex A, Tables 1A-C. Additionally, the walls are to be further protected with earth.
- (3) Underground. An underground installation is only to be considered as such if the top of the installation or storage is below ground level and covered with at least 100 mm of concrete or 600 mm of earth.
- (4) LPG. Unprotected facilities should be sited at the full IBD with the applicable minima. QD less than those for unprotected fuel tanks may be used where the LPG storage tank is provided with structural protection of 150 mm concrete or 215 mm brick walls to a height at least 1 m higher than the top of the tank. Such protection is to be provided on the side(s) exposed to the PES. Under these circumstances, the QD for HD 1.1, as an isolation distance from the LPG tank(s), may be reduced to half the D7 distance given in Chapter 10, Section 2, Annex A, Tables 1A-D, subject to a minimum of 25 m. This protection will resist penetration by debris and low velocity missiles, but it will not provide protection against high velocity primary fragments or lobbed munitions. For this reason, structural measures equivalent to bulk fuel storage (see sub-para 3.2.1(2), above) are required if the facilities are vital. For HD 1.2, HD 1.3 and HD 1.4, a minimum distance of 25 m is required.

3.3 Underground Pipelines

3.3.1 Underground POL, gas and other vital pipelines, except those providing services to a PES, are to be separated from a PES containing HD 1.1 by half the D7 distance given in Chapter 10, Section 2, Annex A, Tables 1A-D, with a minimum distance of 25 m. For PES containing HD 1.2 and/or HD 1.3, a minimum separation distance of 25 m is to be maintained, and for PES containing only HD 1.4, 10 m should be applied.

3.4 Stocks of POL and LOX in Small Quantities For Ready-Use

3.4.1 Quantities not exceeding 3000 litres of fuel furnace oil (FFO) held in storage tanks for domestic heating plants, small quantities of POL not exceeding 100 litres for use in vehicles, MHE and similar equipment, and small quantities of LOX¹ for immediate use do not require a specific QD. However, due regard is to be taken to prevent any fire starting at the POL site from spreading to PES and a minimum distance of 10 m is to be allowed for this reason (but see para 3.6 regarding fuel boilers). Bunds are to be provided for FFO tanks that are capable of containing the complete contents of the tank plus 10%. Where more than these quantities are required they can, with the IE's agreement, be treated as SsD 1.3.3 and sited at the appropriate QD separation.

3.4.2 POL such as paint, shellac etc, required for daily use, may be held within explosives areas but is to be kept to a minimum compatible with requirements and must not be left unattended in explosives facilities.

3.5 Tactical Installations

3.5.1 The criteria specified for the separation of POL from explosives areas are intended primarily for use in determining separations at large permanent ammunition depots. For basic load sites, missile sites and similar small tactical installations, it may be desirable to weigh the cost of distance or protective construction against the strategic value of the POL supplies and the ease of replacement in the event of an incident. Reduced distances may be approved if the POL loss can be accepted, and if the POL facilities are sited so as not to endanger the explosives.

3.6 Fuel Boilers

3.6.1 Boilers fuelled by oil, gas or solid fuel, are normally to be outside explosives storage facilities, but if located within these areas they are to be not less than 45 m from any PES. If oil fired, bunds are to be provided which are capable of containing the complete quantity of fuel oil in the event of a leaking tank. Boiler houses which are an integral part of a HAS may be considered as an entity without the need for separation when considering these precautions.

3.7 Storage Of Hydrazine And Isopropyl Nitrate

3.7.1 If stocks are protected (paras 3.2), a separation distance of twice the D4 distance given in Chapter 10, Section 2, Annex A, Tables 1A-D is to be applied from PES containing HD 1.1, with a minimum distance of 25 m. For HD 1.2, HD 1.3 and HD 1.4, a minimum distance of 25 m is to be applied. If unprotected, a separation distance of at least the IBD, with the applicable minima, is to be applied.

3.8 Non-Flammable Liquid or Compressed Gases

3.8.1 Non-flammable liquid or compressed gases, such as nitrogen or argon, for use in support of missile maintenance, may be stored adjacent to a missile maintenance facility as follows:

- (1) Non-Flammable Liquid Gases. Provided the quantity does not exceed 2000 litres and it is stored in commercially approved cryogenic containers, non-flammable liquid gases will not hazard explosives in the PES. However, the loss

¹ Except in HAS (see Chapter 17).

of the gases and associated equipment is to be expected in the case of an explosive event in the PES.

(2) Non-Flammable Compressed Gases. Provided the quantity does not exceed $2 \times 150 \text{ m}^3$ in manifolded cylinder pallets or similar containers, non-flammable compressed gases will not hazard explosives in the PES. However, the loss of the gas and associated equipment is to be expected in the case of an explosive event in the PES.

3.9 Oil Traps

3.9.1 Oil traps are those installations whose function is to catch and retain, for possible subsequent removal, environmentally hazardous fluids that have contaminated surface water drains, streams and other water courses. These fluids are often highly flammable and so may present a more than normal risk to a PES.

3.9.2 Oil traps are not normally to be sited within an explosives storage site or near a PES. Exceptionally, where the local topography and/or environmental regulations require traps to be fitted to streams or water courses and there are no alternative sites, the traps and the main feeder routes into them (i.e. the stream or water course) are to be sited no closer than 25 m to a PES.

3.10 Incinerators

3.10.1 Incinerators are not to be sited within 100 m of a PES and normally are not to be within the IBD where this is greater than 100 m. The type of incinerators to be provided and the safety devices fitted (e.g. spark arrestors) should influence the choice of site.

3.11 Fire Fighting Training Simulators

3.11.1 Hot fire fighting training simulators (FFTS) utilising pressurised flammable fuels are to be located not less than the IBD from any PES, subject to the applicable minimum distances. This distance not only protects the PES from a conflagration at the FFTS, but also protects users of the FFTS from an event at the PES.

4 ELECTRICAL SUPPLY FACILITIES AND VITAL COMMUNICATIONS LINES

4.1 Introduction

4.1.1 There may be mutual hazards created by siting an explosives area near to high voltage transmission lines, powerful transmitters, vital communications lines etc. Each case must be assessed individually to take account of the voltage and power involved, the importance of the transmission lines, the time for the necessary repairs and the consequences of losing communications at a time when assistance may be required following an explosion.

4.2 Hazard from the Explosives

4.2.1 The PTRD is a reasonable separation, subject to a minimum of 60 m, to protect public service or military emergency communication lines and overhead electrical power transmission lines at 11 kV, or above, or associated substations. Particularly important installations, such as the lines of a supergrid network, should be given greater protection from fragments and debris by affording them at least the IBD. This increased separation is also appropriate for microwave and ultra high frequency (UHF) reflectors which would be vulnerable to damage by air shock or debris and fragments. Minor transmission and communication lines, such as those serving the buildings of the explosives area, may be sited at the appropriate PBD.

4.3 Hazard to the Explosives

4.3.1 The QD determined on the basis of para 4.2, above, should be reviewed in the light of a possible hazard from electrical lines and transmitters to the explosives themselves. See Chapter 8.

4.4 Underground Cables

4.4.1 Underground HV and communication cables, unless directly serving a PES, are unlikely to be damaged outside the crater distance for the explosives building or stack. Therefore, for HD 1.1, the D5 distance at Chapter 10, Section 2, Annex A, Tables 1A-D should provide adequate protection and is to be used wherever possible. (See also Chapter 8). However, to prevent induced currents in either the structure or electrical equipment of a PES, underground cables are not to be laid below any PES, nor pass closer than 15 m to a PES containing any HD.

4.5 Above-Ground Facilities

4.5.1 See Chapter 8.

5 RADIO AND RADAR INSTALLATIONS

5.1 Siting

5.1.1 The regulations pertaining to RADHAZ from such installations are in Chapter 24. However, to provide reasonable safety to such installations from PES, they should not normally be sited within the generated IBD of any PES unless it is operationally necessary to do so and the risk of their damage or loss is acceptable. Where an installation is considered vital, it is to be sited as follows:

- (1) HD 1.1. A minimum of 1½ times the generated IBD.
- (2) HD 1.2. The generated IBD.
- (3) HD 1.3. The generated IBD with no minimum distance.
- (4) HD 1.4. No specific QDs are required.

5.1.2 Where operationally necessary, radio/radar installations may be sited closer than the distances in para 5.1.1 above subject to the following conditions:

- (1) To prevent the aerials, etc, falling onto the PES, they are to be sited no closer than 1½ times the height of any aerial arrays, masts or posts.
- (2) They are to be no closer than the applicable distances specified by Chapter 24.
- (3) Where the installations contains significant fire hazards, e.g. heating oil or flammable gas, they are to be no closer than 25 m.
- (4) The loss of the installation must be accepted, in writing, by the HoE.

5.2 Hazards to the Explosives

5.2.1 Hazards to the explosives are as follows:

- (1) Any firing circuit associated with an electro-explosive device (EED) has an intrinsic capability of picking up signals from an electromagnetic (em) field in the vicinity. In view of the increase in numbers and power levels of military and commercial transmitters, collectively referred to as RF transmitters, it is important that the possibility of inadvertent initiation of an EED and the consequential risk of a serious explosion is considered.
- (2) For EED protection during storage, an explosives area should preferably be sited where the power density/field strength is less than the safety level prescribed by the DOSG Electrical/Explosives Hazards Committee. The administrative action taken to maintain a safe environment must positively ensure that proposals to site additional high power RF transmitters in the vicinity, or where there are changes in the susceptibility of stored EED, does not adversely affect the safety integrity of the storage facility. Explosives (including missiles or any explosive system) containing EED are considered to be fully shielded if they are totally enclosed in metal containers with either soldered-on lids, a lid which is a tight fit on the container, or shielding containers fitted with an effective RF gasket. It is important that all shielding containers are fully Type

Approved. Metal skinned munitions or missile systems into which EED are fitted are considered to be fully shielded. Susceptible munitions must have metal protective covers fitted over the EED.

(3) During explosive workshop/process building activities, where exposed EED may be handled, their susceptibility to em fields will be much greater, therefore the precautions should be more stringent than during storage or transportation. The operating procedures should specify the necessary precautions and the maximum RF energy permitted for each explosive article . The site should always be assessed for potential hazards from transmitters.

(4) During transportation, effective em shielding is the only assured method of providing protection from extraneous em fields.

5.3 Abnormal Field Intensities

5.3.1 In situations where abnormally high field strengths are suspected, expert advice should be sought to evaluate the circumstances.

5.4 Consideration of RF Attenuation Provided by Buildings

5.4.1 Taking a worst case view, building materials, including materials used in barriers, are ineffective in affording RF protection to EED in storage areas. For instance, it is unlikely that the bars in reinforced concrete will provide any significant degree of protection. Therefore, for all practical purposes, it should be assumed that the field strength which is present inside the storehouse is as high as it would be if the building did not exist. The subject concerning the attenuation properties of material/materiel and structures is very complex, and if misunderstood, can be very misleading when a too optimistic approach is taken. The reasons for this are the many variables that must be considered and that can affect the attenuation. These variables include changing amounts of 'clutter' and objects stored inside the enclosure, the frequency of the incident wave and its modulation features, the size of gaps and holes, including windows and doors and the effectiveness of electrical bonding of metal interfaces. The degree of dampness of building material must also be considered.

5.4.2 Additional and more detailed information on the subject is contained in JSP 412, which covers Radio Frequency Radiation Hazards to Electro Explosive Devices during storage and transport, the assessment of a potential hazard, and some useful guidance on safety management.

5.5 Electrical Energy Emitters

5.5.1 Any equipment that emits electrical energy, such as radio transmitters (including emergency services radios likely to be used in the vicinity of explosives, microwave links, portable telephones, personnel communication equipment, car alarm remotes etc) is not permitted within an explosives storage facility or PES unless its use has been authorised beforehand by the ESTC Technical Adviser (Electrical) or it is listed as authorised equipment in Chapter 8 (Chapter 8 also details the requirements for battery operated equipment). Additionally, when permitted, emitters are only to be used within the limitations detailed in Chapter 24.

6 COMPASS BASES

6.1 General

6.1.1 To avoid interference with the correct operation of ac compass bases, no structure or fence is to be sited within 198 m.

7 RADIOACTIVE SUBSTANCES

7.1 Radioactive Sources

7.1.1 The normal storage requirements for radioactive sources are contained in JSP 392. If it is necessary to keep low activity (less than 3,700 MBq) radioactive calibration and/or training sources inside an explosives storage facility, they are to be kept in their authorised outer package and stored in a non-explosives building of robust construction at a minimum of PBD from any PES if above ground, and not less than 2 x IQD if underground. If the building is not of robust construction, a separation distance of at least IBD, with the applicable minima, is to be used. The use of the 'authorised outer package' is considered to be the equivalent of a robust container; accordingly, where the authorised outer package is not available for use, then a steel box, safe or cupboard is to be substituted. The object is to preclude the spread of radioactive material in the event of an explosive event at an adjacent PES.

7.2 Other Radioactive Material and Depleted Uranium

7.2.1 For storage of other radioactive substances, advice is to be sought from CIE(MOD) staff through the appropriate IE. For Depleted Uranium, see Chapter 28.

8 OTHER CONSIDERATIONS

8.1 Miscellaneous Occupied Buildings

8.1.1 The QDs for occupied buildings are normally to be obtained from Chapter 10, Section 2, Annex A, Table 1 to Table 3B as appropriate. Such buildings are to be treated as normal ES depending on their construction and orientation. Additionally, consideration should be given to providing maximum possible protection, either by careful siting, by traversing and/or by reducing or eliminating glass windows.

8.1.2 Except as stated elsewhere, occupied facilities or buildings are normally to be sited beyond the generated IBD for a PES. Where this is not practicable, the criteria for permitting occupied buildings or facilities within the IBD, and therefore at risk, are determined by the safety of personnel and the necessity for them to be within the IBD. The decision as to whether occupied buildings may be sited within the IBD is to be referred to the appropriate IE. However, for personnel directly supporting airfield operations, IEs may authorise reduced QDs in line with Chapter 10, Section 5.

8.1.3 Before deciding whether an occupied building as an ES may be permitted within the IBD of a PES, the following points are to be considered:

- (1) Would the loss of the building make the unit concerned non-operational, i.e. is the building vital?
- (2) Can the building be sufficiently protected other than by distance, i.e. construction, traverses etc?
- (3) The number of people employed, or who may congregate, therein and the nature of their employment.
- (4) Could the task take place in an area away from the PES without detriment to the operational task?

8.1.4 As a guide, the following buildings are generally thought to be vital or at risk and should not be sited within the IBD unless hardened to NATO criteria:

- (1) Operations Centres and Air Traffic Control buildings.
- (2) Telephone exchanges and communications centres.
- (3) Hangars, main workshops, power houses and offices.

8.1.5 Manned non-explosives buildings are not normally to be sited within, or in the close vicinity of, an explosives facility or PES. Exceptions may be made where they are directly associated with the explosives task. The need is to be fully justified by the HoE, in consultation with the IE, and the principle of ALARP demonstrated. In justifying such exceptions the HoE must provide evidence answering the

considerations detailed at para 8.1.3 above and consider the construction requirements of both PES and ES as detailed in Chapter 6.

8.1.6 Other manned non-explosives buildings are to be sighted, according to occupancy and as detailed in Row 25 of appropriate table:

- (1) HD 1.1.²:
 - (a) For less than 20 personnel employed for the whole working day - D11, with the applicable minimum distance.
 - (b) For 20 or more personnel employed for the whole working day - D13 with the applicable minimum distance.
- (2) HD 1.2.³:
 - (a) For less than 20 personnel employed for the whole working day - D6 for SsD 1.2.1, D5 for SsD 1.2.2, or the applicable fixed distance.
 - (b) For 20 or more personnel employed for the whole working day – D2 for SsD 1.2.1, D1 for SsD 1.2.2, or the applicable fixed distance.
- (3) HD 1.3.⁴:
 - (a) For less than 20 personnel employed for the whole working day - D3 for SsD 1.3.3 (with the applicable minimum distance). For SsD 1.3.4 the applicable fixed distance.
 - (b) For 20 or more personnel employed for the whole working day – D4 for SsD 1.3.3 (with the applicable minimum distance). For SsD 1.3.4 the applicable fixed distance.

8.2 Car Parks in the Vicinity of Explosives⁵

8.2.1 Vehicle parks for explosives workers or explosives area support workers are not normally to be sited in an explosives area and should never be closer than 45m. Where vehicle parks cannot be sited beyond PTRD separation the following conditions are to be met:

- (1) The car park is to be at such a level in relation to the PES and so sloped that free flowing fuel is diverted away from the PES.
- (2) Alternatively, where the conditions at sub-para 8.2.1(1) above cannot be met unless there are adequate natural obstructions, sills are to be provided to divert the fuel away from the PES.

8.2.2 The distances prescribed above are intended to safeguard the explosives, not vehicles or their occupants. For car parks used by the general public, non-explosives workers and Service dependants, the reduced PTRD⁶ separation with the applicable minima must be provided from PES.

8.3 Helicopter Landing Pads

8.3.1 Landing pads for the use of unarmed helicopters that are not conveying explosives⁷ are permitted in DM Establishments provided that:

- (1) They are sited not less than 45 m from any PES.
- (2) The unit has conducted a formal Risk Assessment approved by the IE.
- (3) No refuelling, arming or loading with explosives is permitted. The use of ac radar/radios is permitted provided that the RADHAZ emissions are within the limits given in Chapter 24.

8.4 Sports Facilities

² Using Table 1A-C of Chapter 10, Section 2, Annex A.

³ Using Table 2A-F of Chapter 10, Section 2, Annex A.

⁴ Using Table 3A-F of Chapter 10, Section 2, Annex A.

⁵ See also Chapter 16

⁶ $14.8Q^{1/3}$ for HD 1.1.

⁷ For helicopters that are armed or loaded with explosives, use Chapter 10, Section 5.

8.4.1 All sports facilities used for activities of a recreational nature are to be sited in accordance with the following criteria:

- (1) Sports facilities which are designed to hold large crowds (e.g. stadia) require special protection and are never to be closer to a PES than twice the IBD applicable to that PES.
- (2) Clubhouses, changing rooms, indoor ground ranges and other buildings or areas where spectators could reasonably be expected to congregate are to be sited at a minimum of the IBD from the PES. However, buildings assessed as being of vulnerable construction (see Chapter 10 Section 2) are to be sited at twice the IBD applicable to the PES. Furthermore, suitable measures are to be taken to prevent spectators from approaching closer than the IBD to the PES.
- (3) Where structures have been built to enable a recreational or sporting activity to take place, these facilities are to be sited at a minimum of IBD from the PES. In this context, structures are constructions which, in the event of an explosion at the PES, would create a significant hazard to personnel or would act as a source of fragments (e.g. floodlighting towers).
- (4) Where recreational or sporting activities take place without structures, the facilities for competitors or participants may be sited at a minimum of the PTRD applicable to the PES. However, in this case, spectators are not to be permitted at less than the IBD from the PES. Evacuation procedures covering any hazardous event at the PES are to be published in unit orders and repeated in the rules and regulations of the participating clubs or teams. Visitors to the unit using these facilities are to be briefed on those procedures, and on the nature of the risk.

8.4.2 Since the ES presented by sporting facilities are so diverse, it is not possible to give definitive regulations on which PTRD should be used and each case must be subjected to individual assessment in accordance with the spirit of these regulations. In making their assessment, IEs are to take into account the following factors:

- (1) The HD of the explosives at the PES.
- (2) The type of sporting activity, and the potential for injuries being caused in addition to those injuries that might be caused directly by an event at the PES. For example, in a sport such as Go-Kart racing, it is highly likely that an event at a PES would have the secondary effect of causing competitors, in close proximity to that event, to crash resulting in additional casualties. In this type of sport, competitors should be given the protection afforded by the full IBD with no minimum distance. On the other hand, in more sedentary sports such as golf, where casualties would be limited to those caused directly by the event at the PES, and only small numbers of personnel are involved on a transitory basis, the lesser PTRD ($\frac{1}{2}$ IBD) may be used.

8.5 Bulk Drinking Water Supplies

8.5.1 Bulk supplies of drinking water that are above ground, such as water towers, are to be afforded a separation distance of IBD with the applicable minima.

8.6 Non-Explosives Storage

8.6.1 The criteria for separation of those non-explosives related by function to explosives are given in the appropriate sections of Chapter 10.

CHAPTER 10 SECTION 7 ANNEX A

It is essential to study the text in Chapter 10, Section 7, when using this table since they are complementary.

TABULATED QUANTITY DISTANCES FOR NON-EXPLOSIVES BUILDINGS INSTALLATIONS AND FACILITIES						
Installation	Para	HD 1.1	HD 1.2	HD 1.3	HD 1.4	Other Distance(s)/Remarks
Bulk Liquid Fuel - Unprotected Above Ground	3.1.1(1)	IBD	IBD	IBD	>25m	With the applicable minima
Bulk Liquid Fuel - Protected Above Ground	3.1.1(2)	1/2 x D7 >25m	>25m	>25m	>25m	
Bulk Liquid Fuel - Underground	3.1.1(2)	1/2 x D7 >25m	>25m	>25m	>25m	
LPG - Unprotected	3.2.1(4)	IBD	IBD	IBD	>25m	With the applicable minima
LPG - Protected	3.2.1(4)	1/2 x D7 >25m	>25m	>25m	>25m	
LOX – Unprotected	3.1.1(1)	IBD	IBD	IBD	25m	With the applicable minima
Underground Pipelines	3.3	1/2 x D7 >25m	>25m	>25m	>10m	
Ready-use POL	3.4	>10m	>10m	>10m	>10m	Small quantities only
Boilers	3.6	Not usually permitted	Not usually permitted	Not usually permitted	Not usually permitted	Exceptionally, >45m from any PES
Hydrazine and IPN - Protected	3.7	2 x D4 >25m	>25m	>25m	>25m	Full IBD with applicable minima if unprotected
Non-flammable Liquid or Compressed Gas	3.8					See Chapter 10, Section 7
Oil Traps	3.9	Not usually permitted	Not usually permitted	Not usually permitted	Not usually permitted	Exceptionally, >25m from PES

TABULATED QUANTITY DISTANCES FOR NON-EXPLOSIVES BUILDINGS INSTALLATIONS AND FACILITIES						
Installation	Para	HD 1.1	HD 1.2	HD 1.3	HD 1.4	Other Distance(s)/Remarks
Incinerators	3.10	IBD	IBD	IBD	>25m	Exceptionally >100m
FFTS	3.11	IBD	IBD	IBD	>25m	With the applicable minima
Underground Cables	4.4	D5 >15m	>15m	>15m	>15m	For above ground, see Chapter 8
RX/TX and other RADHAZ Emitters	5					See Chapter 10, Section 7
Compass Bases	6	198m	198m	198m	198m	198m from any structure
Radiac Sources (above ground)	7.1	PBD	PBD	PBD	>25m	IBD if ES not substantial
Radiac Sources (underground)	7.1	2 x IQD	2 x IQD	2 x IQD	>25m	-
Miscellaneous Occupied Facilities	8.1					See Chapter 10, Section 7
Car Parks	8.2	IMD >45m	IMD >45m	IMD >45m	>10m	PTRD with applicable minima if car par used by public
Helicopter Landing Pads	8.3	45m	45m	45m	45m	Only if unarmed/not loaded with explosives
Sports Facilities	8.4					See Chapter 10, Section 7
Above ground drinking water (bulk)	8.5	IBD	IBD	IBD	>25m	With the applicable minima