PED

Starter Kit

Contents

- Manufacturers responsibility under the PED
- Template for the Hazard Analysis. This is the starting point, it should consider all the external hazards acting on the item.
- Example Hazard analysis.
- PED Essential Safety Requirements. This is a list of the essential safety requirements plus a column to indicate how each requirement has been met. This column already includes some suggested comments, which can be modified to suit particular requirements. Any ESR that is applicable but can't be satisfied must be stated in your Instruction manual. The columns with references to PD5500 and ASME are for information and can be deleted. The ESR descriptions can be simplified and tailored to suit specific applications.
- A rough outline of the declaration required by the PED. Details of its content are defined in the directive. It is a legally binding document and must be signed by a senior person within your organisation.
- Instruction Manual. Suggested format and content
- Questions. Useful extracts from the ped-eurodyne web site

Please feel free to modify the templates to suit your particular needs.

In applying a CE mark to a vessel a manufacturer is responsible for: -

- Providing a general description of the vessel. This should include its purpose and its intended contents.

- Ensuring that the vessel design pressure and temperature are the maximum foreseeable conditions that the vessel will experience in service.

- Properly designing the equipment so that it will be safe throughout its intended life. The design must be justified by calculations or burst tests.

- Ensuring that the vessel material is compatible with the intended vessel contents. All foreseeable modes of corrosion, erosion and material degradation must be considered. Stress corrosion cracking in Austenitic Stainless Steel is a major problem with vessels that contain water above 50°C. This risk is significantly increased if the fluid level in the vessel is constantly changing.

- Producing Instruction Manuals covering Installation, operation and maintenance. They don't have to be elaborate, for a conventional vessel a one page document may be enough. ALL FORESEEABLE SAFETY HAZARDS MUST BE ADDRESSED. The manual should also list all appropriate ESR's that can't be met, such as fitting safety devices etc. (ESR 3.4)

- Demonstrate that all the appropriate Essential safety requirements stated in the directive, in particular ESR 1, have been met.

- The equipment or assembly must be identified by a name plate, or tag label if the item is small. This must contain :- The name and location of the manufacturer, details of what the assembly includes (a serial number which identifies a list of the individual items will suffice), Year of Manufacture, min and max pressure and temperature, hydraulic test pressure and any other relevant information listed in ESR 3.3. The label must also contain a 'CE' mark if the equipment is in category 1 and above; and if a notified body is involved, their name and registration number must be included.

All NDT operators must be approved by a RSA for Categories 3 and 4. If their approval is via the ASNT system we will need a copy of the written practice and the qualifications of the responsible level 3.

Once the individual items have been installed, the rules of the directive have to be applied again to the completed assembly. If the assembly is carried out on the end user site and the user takes full responsibility for it, then the assembly is exempt from the PED global conformity rules, but the individual items in the assembly are still subject to PED rules.

Equipment: -
Brief Description: -

Hazard	**Control Measure** **{Please delete items in red, for information only}**
Maximum Temperature	{What is the maximum foreseeable temperature the unit can see and what prevents it from being exceeded. Consideration should be given to possible fault conditions and adequate safety margins.}
Minimum temperature	{The lowest operating or start-up temperature caused by: - ambient temperature, chemical reactions, storage of liquefied gasses etc.}
Maximum Pressure (Must exceed safety valve lift pressure)	{What is the maximum foreseeable pressure the unit can see and what prevents it from being exceeded. Consideration should be given to possible fault conditions, such as one chamber of a multi chamber vessel leaking into another; static head of complete system.}
Vacuum conditions	{Vacuum caused by fast discharge or thermal reactions}
Material Compatibility	{Are the intended contents of the vessel compatible with the materials used in its construction? Consideration should be given to corrosion and stress corrosion cracking, erosion, and brittle fracture at low temperature}
Pressure surges, water hammer effects etc. Pipework loadings, fatigue thermal stress.	{Pipework flexibility analysis if appropriate}
Explosion or blast damage, fire and flame hazard, domino effect. Escape of dangerous fluids, discharges etc .	{Protection from fire or explosion of combustible contents}
Damage to equipment during transportation and installation	(Packaging, transport requirements, installation instructions etc.}
Vessel stability	{Wind / Seismic / Snow / Possible collapse during filling}
Operational hazards And Possible Misuse	{Quick release doors etc.. Also possible collision damage from vehicles and cranes }

Equipment: - 2000 Litre Batch Reactor vessel Serial No XXXXXX
Brief Description: - The vessel has been constructed using 316L Stainless Steel with a Carbon Steel outer Jacket. It is suitable for containing any liquid or gas that is chemically compatibly with the materials used in its construction.

Hazard	**Control Measure**
Maximum Temperature	Maximum temperature stated in design specification = 180°C. End user to ensure suitable controls and safety margins exist to prevent it from being exceeded
Minimum temperature	Lowest foreseeable operating temperature stated in design specification = -29°C
Maximum Pressure (Must exceed safety valve lift pressure)	Maximum Pressure stated in design specification = 6 bar g. End user to ensure that a suitable safety device is fitted to prevent it from being exceeded.
Vacuum conditions	Lowest foreseeable operating pressure stated in design specification = Full Vacuum
Material Compatibility	Client responsible for ensuring that the intended contents of the vessel will be compatible with 316L Stainless steel. Brittle fracture of the carbon steel jacket at –29°C to be assessed by PD5500 Annex D
Pressure surges, water hammer effects etc. Pipework loadings, fatigue thermal stress.	Not considered as not stated in design specification. However PD5500 code rules allow for reasonable pipe loadings and pressure surges. No allowance has been made for thermal fatigue; it is assumed that heating and cooling of the vessel will be carefully controlled to minimise thermal stress.
Explosion or blast damage, fire and flame hazard, domino effect. Escape of dangerous fluids, discharges etc .	The vessel has not been designed to accommodate blast damage, flame impingement or any other external hazard. The vessel will be subject to 10% radiography and 100% surface crack detection to minimise risk of leakage.
Damage to equipment during transportation and installation	Packaging and despatch instruction to be supplied.
Vessel stability	Vessel to be adequately supported on three legs. Adequate attachment to floor to be provided by end user
Operational hazards And Possible Misuse	All operational hazards to be assessed by the end user.

PED Essential Safety Requirements - Comparison with BS 5500 and ASME VIII Div 1

The European Pressure Equipment Directive 97/23/EC, (PED), places full responsibility upon the manufacturer of pressure equipment to comply with the provisions of the Directive. On completion of all design, manufacturing, inspection and testing procedures, and after verification of conformity, the manufacturer can make a Declaration of Conformity with the PED. The manufacturer can then affix the CE marking which ensures that the equipment will have freedom of movement within the European Community.

An important requirement is that the manufacturer must comply with all the Essential Safety Requirements, (ESRs), in Annex 1 of the PED which are relevant to the equipment for which he makes the Declaration of Conformity.

The following table provides a summary of all the ESRs and shows, by reference to the relevant clauses in BS 5500 and ASME VIII Div 1, where it is considered that these codes satisfy the ESRs.

Numbers in brackets refer to notes at the end of the table.

	Sub Section	PED Essential Safety Requirement	ASME VIII Div 1	BS 5500	Comments
1		**General**			
	1.1	Equipment must be designed, manufactured and checked, and installed in such a way as to ensure its safety when put into service in accordance with the manufacturer's instructions.	(6)	(1)	Equipment design and manufacture checked by *{#your company#}* QA system and inspected by RSA Installation:- Responsibility of end user
	1.2	Manufacturer must apply the principles set out below in the following order: - eliminate or reduce hazards as far as is reasonably practicable, - apply appropriate protection measures against hazards - inform users of residual hazards	(6)	(1)	Refer to Hazard analysis
	1.3	The pressure equipment designed to prevent danger from misuse or, adequate warning given.	(6)	(1)	Refer to Hazard analysis
2.		**Design**			
	2.1	The pressure equipment must be properly designed to be safe throughout its intended life. Design must incorporate appropriate safety coefficients.	U-2	3.1	Refer to design calculations
	2.2.1	To be designed for loadings appropriate to its intended use.	UG-22	3.2.1	Refer to design calculations
	2.2.2	Design for adequate strength based on:			

		- a calculation method and supplemented if necessary by an experimental design method. - an experimental design method without calculation, when the product of the maximum allowable pressure PS and the volume V is less than 6 000 bar.L.	U-2	3.2.2 3.2.2(3)	Refer to design calculations
	2.2.3(a)	The allowable stresses for pressure equipment must be limited having regard to reasonably foreseeable failure modes, safety factors must be applied to. Requirements may be met by applying one of the following methods: - design by formula - design by analysis - design by fracture mechanics; Note:- Design by analysis or fracture mechanics only permitted where formulas do not exist	UG-23 (8)* U-2(g)	 Section 3 Annex A Annex U	Design stresses in accordance with PED and PD5500 requirements Designed by PD5500 formula
	2.2.3(b)	Appropriate design calculations must be used to establish the resistance of the pressure equipment concerned. In particular: - the calculation pressures must not be less than the maximum allowable pressures and take into account static head and dynamic fluid pressures and the decomposition of unstable fluids. - the calculation temperature must allow for appropriate safety margin. - the design must take appropriate account of all possible combinations of temperature and pressure which might arise under reasonably foreseeable operating conditions. - maximum stresses and peak stress kept within the safe limits. - the calculation for pressure containment must utilize the values appropriate to the properties of the material, based on documented data. - appropriate joint factors must be applied. - the design must take appropriate account of all reasonably foreseeable degradation mechanisms.	 UG-21 UG-20 UG-22 UG-23 UG-23 UG-27 UG-25	 3.2.3 3.2.4 3.2.4/3.2.5 3.1.1 Annex K (1) 3.2.4/3.3 Annex C	Refer to design Calculations

	2.2.3(c)	- calculated allow for adequate structural stability taking into account the risks from transport and handling	(7)	(2)	Refer to Design Calculations
	2.2.4	Design by experimental method must be validated by an appropriate test programme on a sample representative of the equipment. Test programme must be clearly defined and must include a pressure strength test.	UG-101	3.2.2 & 5.8.6 (3)	N/A
	2.3	Provisions to Ensure Safe Handling and Operation Method of operation specified for pressure equipment must be such as to preclude any reasonably foreseeable risk in operation of the equipment. Particular attention must be paid to: - closures and openings, - dangerous discharge of pressure relief blow-off, - devices to prevent physical access whilst pressure or a vacuum exists. - surface temperature taking into consideration the intended use, - decomposition of unstable fluids. Pressure equipment fitted with an access door must be equipped with an automatic or manual device enabling the user easily to ascertain that the opening will not present any hazard. Where the opening can be operated quickly equipment must be fitted with a device to prevent it being opened whenever the pressure or temperature of the fluid presents a hazard	(8) UG-36 UG-135(b) (8)UG-35(b) (7) (7) (7) UG-35(b)	(1)	{Describe safety provisions if any of these risks apply}
	2.4(a)	Pressure equipment must be designed and constructed so that all necessary examinations to ensure safety can be carried out;	UG-46	3.12 (3)	Adequate inspection access provided
	2.4(b)	Means of determining the internal condition of the equipment must be available	UG-46	3.12	{#Briefly describe Inspection Access provided#)
	2.5	Means must be provided for the draining and venting of pressure equipment where necessary: - to avoid harmful effects such as water hammer, vacuum collapse, corrosion and uncontrolled chemical reactions.	(UG-25(b) (7)	(1)	{#Briefly describe provisions for draining if applicable#)

		- to permit cleaning, inspection and maintenance in a safe manner.	UG-46		
	2.6	Adequate allowance or protection against corrosion or other chemical attack must be provided.	UG-25	3.3	Light corrosion of the vessel's internal surface is foreseeable, therefore an internal allowance of 1.6mm has been included in the design
	2.7	Where erosion or abrasion may arise, adequate measures must be taken to: - minimize that effect by appropriate design e.g. replacement of parts instructions.	(8) UG-26	3.3.4(3)	Erosion and abrasion not foreseen.
	2.8	Assemblies must be so designed that: - the components to be assembled together are suitable and reliable for their duty - all the components are properly integrated and assembled in an appropriate manner.	(7)	(2)	N/A
	2.9	Equipment must be so designed and provided with accessories or provision made for their fitting, as to ensure safe filling and discharge in particular with respect to hazards such as: On Filling: - overfilling or overpressurization; - instability of the pressure equipment; - on discharge the uncontrolled release of the pressurised fluid; - on filling or discharge; unsafe connection and disconnection	(6)	(1)	{Briefly describe what steps have been taken to address these points if they are appropriate to the design)
	2.10	Where the allowable limits could be exceeded, the pressure equipment must be fitted with, or provision made for the fitting of, suitable protective devices determined on the basis of the particular characteristics of the equipment or assembly.	UG-125	3.13	{Briefly describe if provision has been made to accommodate a safety valve)
	2.11.1	Safety accessories must: - be designed and constructed as to be reliable and suitable for their intended duty, - be independent of other functions, - comply with appropriate design principles in order to obtain suitable and reliable protection.	UG-126 UG-127	3.13.1 3.13.1 3.13.1	Safety accessories to be supplied by end user
	2.11.2	Pressure Limiting Devices	UG-131	3.13.2	The end user must fit an adequately sized pressure relief

		Must be so designed that the pressure will not permanently exceed the maximum allowable pressure			valve to prevent design pressure from being exceeded
	2.11.3	Temperature Monitoring Devices Must have an adequate response time.	(6)	(1)	End user to provide temperature control equipment if required by the process.
	2.12	Where necessary, pressure equipment must be so designed and, where appropriate, fitted with suitable accessories, to meet danger-limitation requirements in the event of external fire.	UG-125 U 2 & 3	1.1.5(3)	End user to provide suitable fire protection if required
3		**Manufacturing**			-
	3.1	The manufacture must ensure the competent execution of the provisions set out at the design stage by applying the appropriate techniques and relevant procedures, especially with a view to the aspects set out below.			Manufacture carried out to {your company} QA procedures
	3.1.1	Preparation of the component parts must not give rise to defects or cracks or changes in the mechanical characteristics likely to be detrimental to the safety of the pressure equipment.	UG-76	4.2	{Briefly describe any severe cold working that will require heat treatment, if applicable}
	3.1.2	Permanent joints and adjacent zones must be free of any surface or internal defects detrimental to the safety of the equipment. The properties of permanent joints must meet the minimum properties specified for the materials to be joined unless relevant property values are specifically taken into account in design. Permanent joining of components which contribute to the pressure resistance of equipment and components which are directly attached to them must be carried out by suitably qualified personnel according to suitable operating procedures. For pressure equipment in categories II, III and IV, operating procedures and personnel must be approved by a competent third party which, at the manufacturer's discretion, may be: - a notified body - a third-party organisation recognised by a Member State as provided for in Article 13.	(7)UW-35 Section IX UW-28 UW-29 (7)	5.6(3) 4.3 4.3 4.3	All welding operations correctly planed and co-ordinated to {your company} welding procedure specifications. All welding procedures qualified to BSEN 288 Part 3 All welders approved to BSEN 287 Part 1 Ref. PD5500 Section 4.3
	3.1.3	Non-destructive tests of permanent joints must be carried out by	UW-	5.6.1	All NDT Operators approved By Notified Body

		suitable qualified personnel. For pressure equipment in categories III and IV, the personnel must be approved by a third-party organisation.	51(a)2 App 6 App8		
	3.1.4	Where the manufacturing process will change the material properties to impair the safety of the pressure equipment, suitable heat treatment must be applied at the appropriate stage of manufacture.	UW-40	4.4	{Is any post weld heat treatment is required?}
	3.1.5	Procedures must be established and maintained for identifying the material making up the components.	UG-77	4.1.2	Control and identifications of all materials is subject to {Your Company} QA procedures
	3.2	Pressure equipment must be subjected to final assessment as described below.			-
	3.2.1	Equipment must undergo a final inspection to assess visually and by examination of the accompanying documents compliance with the requirements of the Directive. The final inspection must be carried out internally and externally on every part of the equipment, where appropriate in the course of manufacture.	UG-97	5.1(3)	Final inspection carried out in accordance with {your company}QA procedures and verified by Notified Body
	3.2.2	Final assessment must include a test for the pressure containment aspect, which will normally take the form of a hydrostatic pressure test. For category 1 series-produced pressure equipment, this test may be performed on a statistical basis. Where the hydrostatic pressure test is harmful or impractical, other tests of a recognised value may be carried out.	UG-99 (7) UG-100	5.8(3) Annex V (3) 5.8.4	Hydraulic Test carried out in accordance with the requirements of PD5500 Section 5.8
	3.2.3	For assemblies, the final assessment must also include a check of the safety devices intended to check full compliance with the requirements referred to in 2.10.	UG-125*	(1)	N/A
	3.3	In addition to the CE marking the following information must be provided:			-
	3.3(a)	the name and address of the manufacturer and, where appropriate, of his authorised representative established within the Community. - the year of manufacture,	(7)	1.4.4 5.8.9(3)	See Name plate drawing

		- identification of the pressure equipment - essential maximum/minimum allowable limits Note:- Safety devices, whilst in the ASME need not be fitted by the manufacturer.			
	3.3(b)	depending upon the type of equipment, further information necessary for safe installation, operation or use and, where applicable, maintenance and periodic inspection.	(7)	(2)	End user to provide full inspection and maintenance instructions
	3.3(c)	where necessary, warnings fixed to the equipment drawing attention to misuse which experience has shown might occur.	(7)	(2)	{Describe any labelling of hazards}
	3.4	Operating Instructions		(1)	To be supplied by End user
4		**Materials** Materials used for the manufacture of pressure equipment must be suitable for such application during the scheduled lifetime unless replacement is foreseen.	UG-4	2.1	-
	4.1	Materials for pressurised parts must:			-
	4.1(a)	have appropriate properties for all operating conditions and be sufficiently ductile and tough. Due care should be exercised, in particular, in selecting materials in order to prevent brittle-type fracture;	UG-4 UG-84	2.2(3)	Material selection in accordance with the requirements of PD5500 {Reference to Annex D should be made if vessel could operate below 0°C}
	4.1(b)	be sufficiently chemically resistant to the fluid contained in the pressure equipment;	UHA-6 (8)	3.3.1	{state if material selection was made by end user}
	4.1(c)	not be significantly affected by ageing;		(2)	N/A
	4.1(d)	be suitable for the intended processing procedures;	(7)	(2)	{Is the material is difficult to form or join}
	4.1(e)	be selected in order to avoid significant undesirable effects when the various materials are put together.	UG-18	(2)	N/A
	4.2(a)	The pressure equipment manufacturer must define in an appropriate manner the values necessary for the design calculations referred to in 2.2.3 and	(4) User ?	(4)	Material design stress determined by PD5500 Annex K
	4.2(b)	the manufacturer must provide in his technical documentation elements relating to compliance with the materials specifications of the Directive in one of the following forms: - by using materials which comply with harmonized standards - by using materials covered by a European approval of pressure	(7)	2.1.2 (3)	Materials approved by particular material appraisal

		equipment materials - by a particular material appraisal;			
	4.2(c)	for equipment in categories III and IV, particular appraisal as referred to in the third indent of (b) must be performed by the notified body in charge of conformity assessment procedures for the pressure equipment.	(6)	(2)	{PMA carried out By Notified Body}
	4.3	Manufacturer must take appropriate measures to ensure that the material used conforms with the required specification. In particular, documentation prepared by the material manufacturer affirming compliance with a specification must be obtained for all materials. For equipment in categories II, III and IV, this must take the form of a certificate of specific product control. Where a material manufacturer has an appropriate quality-assurance system, certified by a competent body established within the Community and having undergone a specific assessment for materials, certificates issued by the manufacturer are presumed to certify conformity with the relevant requirements of this section.	UG-93 UG-93 (6)	(2)	Materials inspection certificate to BSEN10204 3.1b
5		**Fired or Otherwise Heated Pressure Equipment with a Risk of Overheating.** Equipment must be calculated, designed and constructed so as to avoid to minimise risks of a significant loss of containment from overheating.	(6)	(5)	N/A
6		**Piping**	(6)	(1)	
	6(a)	That the risk of overstressing from inadmissible free movement or excessive forces being produced, e.g. on flanges, connections, bellows or hoses, is adequately controlled by means such as support, constraint, anchoring, alignment and pre-tension;	-	-	{Pipework flexibility to be accessed by end user}

	6 (b)	That where there is a possibility of condensation occurring inside pipes for gaseous fluids, means are provided for drainage and removal of deposits from low areas to avoid damage from water hammer or corrosion;			{Drainage provisions to be provided by end user End user to consider and access design implications}
	6 (c)	That due consideration is given to the potential damage from turbulence and formation of vortices; the relevant parts of 2.7 are applicable;			{End user to consider and access design implications}
	6 (d)	That due consideration is given to the risk of fatigue due to vibrations in pipes;			{Fatigue to be assessed by end user}
	6 (e)	That, where fluids of Group 1 are contained in the piping, appropriate means are provided to isolate 'take off' pipes the size of which represents a significant risk;			{No take off points}
	6 (f)	That the risk of inadvertent discharge is minimised; the take-off points must be clearly marked on the permanent side, indicating the fluid contained;			{No take off points}
	6(g)	That the position and route of underground piping is at least recorded in the technical documentation to facilitate safe maintenance, inspection or repair.			N/A
7		**Specific Quantitative Requirements for Certain Pressure Equipment.**			
	7.1	Allowable stresses		Annex K (3)	Allowable design stresses To PD5500 Annex K
	7.2	Joint coefficients		(1)	
	7.3	Pressure limiting devices, particularly for pressure vessels The momentary pressure surge must keep to 10% of the maximum allowable pressure.		Annex J	End user to fit a suitable safety device
	7.4	For pressure vessels, the hydrostatic test pressure must be no less than: - that corresponding to the maximum loading to which the pressure equipment may be subject in service taking into account its maximum allowable pressure and its	UG-99	5.8(3)	Hydraulic test carried out to the rules of PD5500

		maximum allowable temperature, multiplied by the coefficient 1.25 or - the maximum allowable pressure multiplied by the coefficient 1.43 whichever is the greater.			
	7.5	Unless other values are required in accordance with other criteria that must be taken into account, a steel is considered as sufficiently ductile to satisfy 4.1(a) if, in a tensile test carried out by a standard procedure, its elongation after rupture is no less than 14% and its bending rupture energy measured on an ISO V test-piece is no less than 27 J, at a temperature not greater than 20°C but not higher that the lowest scheduled operating procedure.	(6)	(2)	All materials selected from PD5500 for pressure retention.

Notes:

(1) Outside scope of current BS 5500.

(2) Requirements not given in BS 5500. Consideration needed to inclusion?

(3) Referenced BS 5500 clause does not cover scope of ESR. Consideration needed to extend clause?

(4) Uncertain as to meaning of ESR

(5) Fired heaters outside BS 5500 scope, however process heaters are.

ASME

(6) Outside the scope of ASME

(7) Requirement not addressed in ASME

(8) Requirement not fully addressed in ASME

Operating Instructions {Required by ESR 3.4}

The end user of the equipment must ensure that it is suitable for its purpose and the installation, operation and maintenance are carried out by competent persons.
{The operating/maintenance instructions must address all safety risks identified by hazard analysis and ESR verification. They should include: - Installation including assembly and mounting, Commissioning, Operation, Maintenance and Inspection. It is important that you clearly define what the user is responsible for, and use this document to limit your liability.}

Safe Operating Limits

Maximum Design Pressure = xx barg	Minimum Design Pressure 0 barg
Maximum Design Temperature = xx°C	Minimum Design Temperature = 0°C

A suitably sized and rated safety valve must be provided. The set pressure must ensure that no part of the equipment will experience pressure above the design limit. No pressure surge must exceed 1.1 x design pressure.

{If a vacuum is foreseeable and the equipment design will not withstand it, a suitable sized and rated anti vacuum device must be fitted or other provision made.}

No allowance has been made for thermal fatigue; it is assumed that heating and cooling of the vessel will be carefully controlled to minimise thermal stress

Vessel Contents {if the vessel contents have not been specified}

The user is responsible for ensuring that the contents of the vessel will be compatible with the materials used to construct the vessel, at the full range of operating temperatures. {State corrosion allowance if applicable. Reference must be made to water quality if stress corrosion cracking is foreseen}.

Location and installation

The pressure equipment must be located such that it will not give rise to danger, from dangerous discharges, overpressure/explosion, and fire wind, ice and snow loading. {Any special foundation requirements?}

Commissioning

The pressure equipment must be checked for satisfactory installation. All connections must be secure and leak tight.

Lifting

When lifting and transporting the vessel care must be taken to ensure nothing is damaged or strained. All nozzles and projections must be suitable protected. {Specify lifting provision }

Loading
Only loading due to the weight of the vessel and its contents have been considered; any additional loading from attachments and pipework must be carefully analysed before the vessel is put into service.

Fire protection
{Only if vessel contents are flammable}

Maintenance
The operational functions of the equipment must be checked at regular intervals, and any leaks must be rectified immediately. An adequate system of isolation must be provided to permit safe inspection and maintenance. {Include any special maintenance and cleaning requirements}

Inspection
The end user must provide an adequate system for venting and draining the equipment. Routine inspection must be coordinated by a competent person; the competent person must produce a scheme of inspection, which must be in accordance with any applicable state regulations. {State inspection provision/access provided for periodic assessment of the internal condition of the equipment}

Declaration Of Conformity

Dyson Engineering
Address

Equipment:- Pipework Downstream of P-PCV-32 (TAG P-PW-SL-104)

Description Of Equipment:- 8 Inch Steam Line with Trap Assemblies (List all relevant general arrangement or ISO drawings. Making clear where all the termination points are.)

Conformity Assessment Procedure A1, (Category 2)

Notified Body:- Royal & Sun Alliance
17 York Street, Manchester. M2 3RS

Notified Body Number :- 0040

Directives Complied With:- **The pressure Equipment Directive 97/23/EC**
{And all other applicable directives, such as : Machinery Directive 98/37/EC if the item is fitted with powered machinery. Unfortunately the list of applicable directives for electrically powered equipment can be huge, and the rules stipulate that all of them have to be listed, not just the principle ones. And there is no certificate of incorporation available in the PED.}

Design And construction Standards Applied:- ASME B31 B +
Client Specification ???

Signature

Name and Rank of signatory

Question: How to apply conformity assessment modules when some parts of an item of pressure equipment or some operations are sub-contracted ?

Answer: There is only one manufacturer taking responsibility for each item of pressure equipment, who chooses one module (or combination of modules).

The conformity assessment is related to an item of pressure equipment and not to the parts considered alone.

It is the responsibility of the pressure equipment manufacturer to obtain from his sub-contractor the information and documentation required for the application of the module chosen. Depending on the module, the notified body could be required to visit the sub-contractor site, and it is the responsibility of the pressure equipment manufacturer to ensure access. If relevant work has been performed by different notified bodies at the sub-contractor site, it should be taken into account.

Question: Are replacements, repairs or modifications of pressure equipment in use covered by the directive ?

Answer: 1) Entire change: the complete replacement of an item of pressure equipment by a new one is covered by the PED.
2) Repairs are not covered by the PED but are covered by national regulations (if any).
3) Pressure equipment which has been subject to important modifications that change its original characteristics, purpose and/or type after it has been put into service has to be considered as a new product covered by the directive. This has to be assessed on a case by case basis.

Question: When is a modification of a piping system not covered by the PED?

Answer: When the content, main purpose and safety systems remain essentially the same, it may be regarded as a non important modification of an existing piping system and is therefore not covered by the PED.

Question: What is a pressure accessory ?

Answer: According to the definition (see article 1.2.1.4) pressure accessory means a device with an operational function and having an identifiable pressure-bearing housing - i.e. the device has a function additional to that of containing pressure.

The pressure accessory can be attached to other pressure equipment for example by bolting, brazing, soldering or welding. A pressure accessory has a specific operational function (or functions), which could be for example: measurement, change the mechanical characteristics of the fluid flow, taking a sample, removal of sediment or gas. A pressure accessory does not necessarily have moving parts.
Typical examples of pressure accessories are: valves, pressure regulators,

measurement chambers, pressure gauges, water gauge glasses, filters and expansion joints.

The following examples are not pressure accessories:
- safety valve (a safety accessory)
- cover, collar, gasket, flange, bolt (components of a pressure equipment)
- sight glass with its frames (components of a pressure equipment)

Question: Are piping components, such as a pipe or system of pipes, tubing, fittings, expansion joints, hoses, or other pressure bearing components, considered to be piping when they are placed on the market as individual components?

Answer:

Individual piping components, such as a pipe or system of pipes, tubing, fittings, expansion bellows, hoses, or other pressure bearing components are not "piping".
However, a single pipe, or a system of pipes, for specific application, may be classed as "piping", provided all appropriate manufacturing operations such as bending, forming, flanging and heat treatment, have been completed. Some piping components (e.g. expansion joints) may be considered to be pressure accessories

Remark: Please note the definitions related to expansion joints and to expansion bellows.

Expansion joints are devices containing one or more bellows used to absorb dimensional changes such as those caused by thermal expansion or contraction of a pipeline, duct or vessel.

Expansion bellows are flexible elements of an expansion joint consisting of one or more convolutions and the end tangents.

Question: What guidance can be given regarding the application of the Directive to component parts of pressure equipment such as flanges, dished ends and nozzles ?

Answer: If these component parts are incorporated to an item of pressure equipment, the relevant requirements of the directive will apply.

However, these component parts do not meet the definition of pressure equipment in Article 1.2.1, therefore they shall not bear the CE mark.

It is the responsibility of the pressure equipment manufacturer to ensure that the component parts enable the pressure equipment to meet the essential safety requirements of the directive.