

Specifying, procuring & managing 3rd party inspection services

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Engineering Equipment and Materials Users Association

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- Developing user guides, Specifications, training and competency schemes.
- Facilitating members' participation in national and international standards making.
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Comments are considered by the relevant EEMUA Technical Committees and may be incorporated in future editions of this Publication. New editions are publicised on the EEMUA website.

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Preface

Much of the existing process plant throughout the world is now many years old. Without continuous inspection and maintenance by its owners the equipment would have deteriorated beyond service long ago, possibly causing harm to personnel and damage to the environment.

In general, each country has its own legislation defining how operators should manage their plant in order to maintain safety and minimise the risks to the people and the environment. In many cases this is then enforced by Regulators who have the authority to visit operator sites and, if necessary, enforce the temporary or permanent closure of sites.

Depending on the country concerned, companies will adopt an integrity management process in which they will either conduct all the inspection themselves or contract external organisations to conduct the inspection for them. However, those organisations that rely on User Inspectorates also use contractors to provide specialised services or additional resource at busy times.

This Publication is primarily based around UK legislation which allows for operators to utilise their own user inspectorates as well as external organisations in their integrity management.

However, operators with plant in countries other than the UK will also find the publication informative. There will be equivalent legislation to the UK referenced, and operators in countries in which third party inspection companies are employed as a norm will find valuable advice within this guide.

Summary

There is a self-evident requirement for the owners and operators of process plant handling hazardous materials to maintain the primary containment envelope and ensure that the risks from leaks and other incidents are minimised. A major element in maintaining the integrity of the primary containment is timely and effective inspection, the purpose of which is to identify defects before they are able to develop and lead to an uncontrolled loss of containment. In some companies, particularly the larger petrochemical organisations, the primary containment is monitored by in-house, or second party inspection bodies (2ndPIBs) whilst others employ the contracted services of outside organisations referred to as third party inspection bodies (3rdPIBs). As it is unlikely that a 2ndPIB will always be able to do all the inspection work required by their parent organisation there will often be a mix of 2ndPIB and 3rdPIB involvement.

The recent increase in emphasis on inspection as part of a risk control strategy has resulted in a need to ensure that the service provided by inspection organisations is suitable for the particular application. In addition the British Health and Safety Executive (HSE) have recently highlighted concerns with companies who engage 3rdPIBs for specific tasks (e.g. acting as Competent Persons under the Pressure Systems Safety Regulations 2000 (PSSR)¹) and who fail to recognize the wider issues related to the control of risks from other or associated hazards (e.g. fire, explosion, danger to the environment). As a consequence the HSE has identified potential differences in company risk control arrangements when 2ndPIBs and 3rdPIBs are employed. The HSE has also identified issues related to differences in plant operational knowledge between 2ndPIBs and 3rdPIBs that can also influence the quality of the information at the disposal of the IB when formulating inspection recommendations.

This Publication has been developed as a result of the perceived differences between the use of 2ndPIBs and 3rdPIBs. It is intended to provide guidance to the companies using the latter organisations and to assist in the development of the contractual and managerial relationships between the inspection bodies (IB) and the process plant owners and operators. It is also intended to provide guidance to those organisations with their own IB as the relationship between the two is similarly important.

The guide has resulted from requests from EEMUA members to provide a basis on which they could build their own working practices and it should not be seen purely as a document written for the benefit of the regulator.

The layout of this Publication follows that used in the Chemical and Downstream Oil Industry Forum (CDOIF) document 'Guidance on the Use of External Contractors in the Management of Ageing Plant'.²

1. Introduction

1.1 Definition of different inspection bodies

An Inspection Body (IB) is an organisation that provides inspection services to process plant operators. An IB must have its own management structure but can be a part of another, larger organisation provided it is sufficiently independent to be able to offer an authoritative technical opinion free from financial or production pressures.

An IB can be:

- part of an organisation that designs and builds process plant (also known as 'first party' inspection bodies - 1stPIB),
- part of an organisation that operates such plant (also known as 'second party' inspection bodies - 2ndPIB or User Inspectorate (UI)); or
- a specialist organisation providing inspection services alone (also known as 'third party' inspection bodies - 3rdPIB).

The international standard to which most IBs conform, ISO 17020³, defines these IBs as Type A, B or C. (See Annex A of the standard for more detail.) The United Kingdom Accreditation Service (UKAS) audits IBs to this standard within the UK and then issues an accreditation certificate to those that are deemed to meet the requirements specified.

The in-service inspection of process plant is normally provided by a 2ndPIB or 3rdPIB or some combination. In some large companies the majority of inspection will be conducted by an in-house inspection department, that is, a 2ndPIB. However it is very likely that such an organisation will have to routinely employ 3rdPIBs to provide specialist services or even more simple services at busy periods.

1.2 Issues with third party Inspection Bodies

Historically, inspection requirements for items of plant or equipment in widespread use throughout industry were specified in law and tended to be based on fixed interval inspections often aligned to major shutdown or holiday periods. This tended to suit 3rdPIBs as they used their extensive knowledge of potential failure modes for similar plant used in many industrial applications and could arrange inspections to coincide with these fixed intervals. Increased reliance on Risk Based Inspection (RBI) techniques has resulted in much more variation in inspection intervals and the need for the inspector to be aware of more complex degradation mechanisms linked to operational parameters. There is also a need to comply with more stringent legal requirements covering health, safety and environmental concerns. This leads to more complex contractual arrangements between the IB and its customer.

A significant difference between 2ndPIBs and 3rdPIBs can be that the former have a much closer relationship with the plant operators than is possible with the latter and therefore potentially a better understanding of plant operating history. This is often because the relationship between a process plant operator and his 3rdPIB is contractual and therefore has to be arranged before a contract is placed. This disadvantage can be reduced when the 3rdPIB is resident on the site or by careful design of the contractual arrangements. However, the closer relationship between 2ndPIBs and customers needs to be handled with care to preserve the required degree of independence from production or financial pressures.

Some industry sectors rely exclusively on third party support while in other it is established practice for in-house second party inspection organisations without UKAS accreditation to

produce detailed inspection programmes that are then reviewed by and certified as suitable by an accredited third party organisation. This latter third party organisation approves the written schemes and supporting documentation and reviews examination results in order to grant approval for continued operation as the Competent Person under the PSSRs. There are some advantages in having a third party approval of such inspections and written schemes of examination in that in-house decisions are scrutinised by an organization accredited to act as an independent Competent Person and able to demonstrate a degree of independent decision making from the customer. However, there are potential areas of concern relating to communication with third party Competent Persons, who may not have a permanent presence on site and potentially be unaware of operational changes, maintenance issues and repair history. It is therefore necessary to involve the 3rdPIB in routine site meetings and reviews of documentation. The principles therefore still hold of ensuring good definition and understanding of the roles and responsibilities for all those involved in integrity management including operators, maintenance departments, in house and third party inspection organisation and third party Competent Person organisations who grant approval for continued operation until the next examination.

In many instances 3rdPIBs are the engineering arm of insurance companies and the inspection can be seen as an appendage to an insurance contact. This means that there is a risk that the contract details are not specified sufficiently accurately to maximise the integrity of the plant primary containment. It is thus important to ensure that the contract placed for services includes sufficient detail to ensure that the inspection is carried out competently.

The British HSE has recently highlighted concerns with companies who employ 3rdPIBs for specific

tasks (e.g. acting as Competent Persons under the PSSR) and who fail to recognize the wider issues related to the control of risks from other or associated hazards (e.g. fire, explosion, danger to the environment). As a consequence it has identified potential differences in company risk control arrangements when 2ndPIBs and 3rdPIBs are employed. It has also identified issues related to differences in plant operational knowledge between 2ndPIBs and 3rdPIBs that can influence the quality of the information at the disposal of the IB when formulating inspection recommendations.

Accordingly the Chemical and Downstream Oil Industries Forum (CDOIF)^a has produced a short guidance document³ aimed at improving the relationship between the plant operators and the third party contractors. The guidance document is, as intended, an overview, conceptual in format and sets a number of targets to be met. This current EEMUA Publication provides more detail on those concepts and how those targets can be achieved. It is intended to compliment the CDOIF document.

^aThe Chemicals and Downstream Oil Industries Forum was established in 1997 by the British HSE and is a collaborative venture formed to agree strategic areas for joint industry / trade union / regulator action aimed at delivering health, safety and environmental improvements with cross-sector benefits.

1.3 Purpose of the guide

This EEMUA guide is to help plant owner and operators to work with 3rdPIBs. It is primarily concerned with the inspection of plant containing hazardous materials, where primary containment is the main focus. However, there is much that may be applied to procurement of inspection services for other purposes.

1.4 Format of the Guide

This guide complements and builds on the original CDOIF publication; the format is closely based on that publication which includes a simple flowsheet (reproduced below) to illustrate the steps involved. This EEMUA publication takes each of those steps and expands on them giving more detail to help operators to develop their own system. Throughout both the CDOIF guidance and this Publication it is assumed that the contractor is providing inspection services in the widest sense. They cover all stages from agreeing what is to be inspected and how, through to completing the report and certifying that the equipment is fit for service or that it requires further work to ensure its continued safe operation.

The following sections describe in some detail what is required from an IB and why it has to be provided. It is particularly important that the various responsibilities involved are made clear so a table is provided, that can be used as a check list if required, to allow these responsibilities to be clearly allocated. This can then form the basis of a contractual arrangement in a way that will minimise the risk that an important aspect is neglected or overlooked.

Similarly both the EEMUA and CDOIF publications concentrate on the technical relationship between the plant operator and the 3rdPIB. It is envisaged that the contractual arrangements will formalise these relationships in a legal framework; no attempt has been made to define how the contracts should be worded as this will depend to a large extent on the particular policies of the companies involved. However some guidance is given on the process of agreeing the contract.

2 The use of External Contractors

The CDOIF publication includes a flow chart to illustrate an example of dealing with a 3rd PIB. The current document uses that as its basis and takes each part of the flow chart in turn and expands on it.

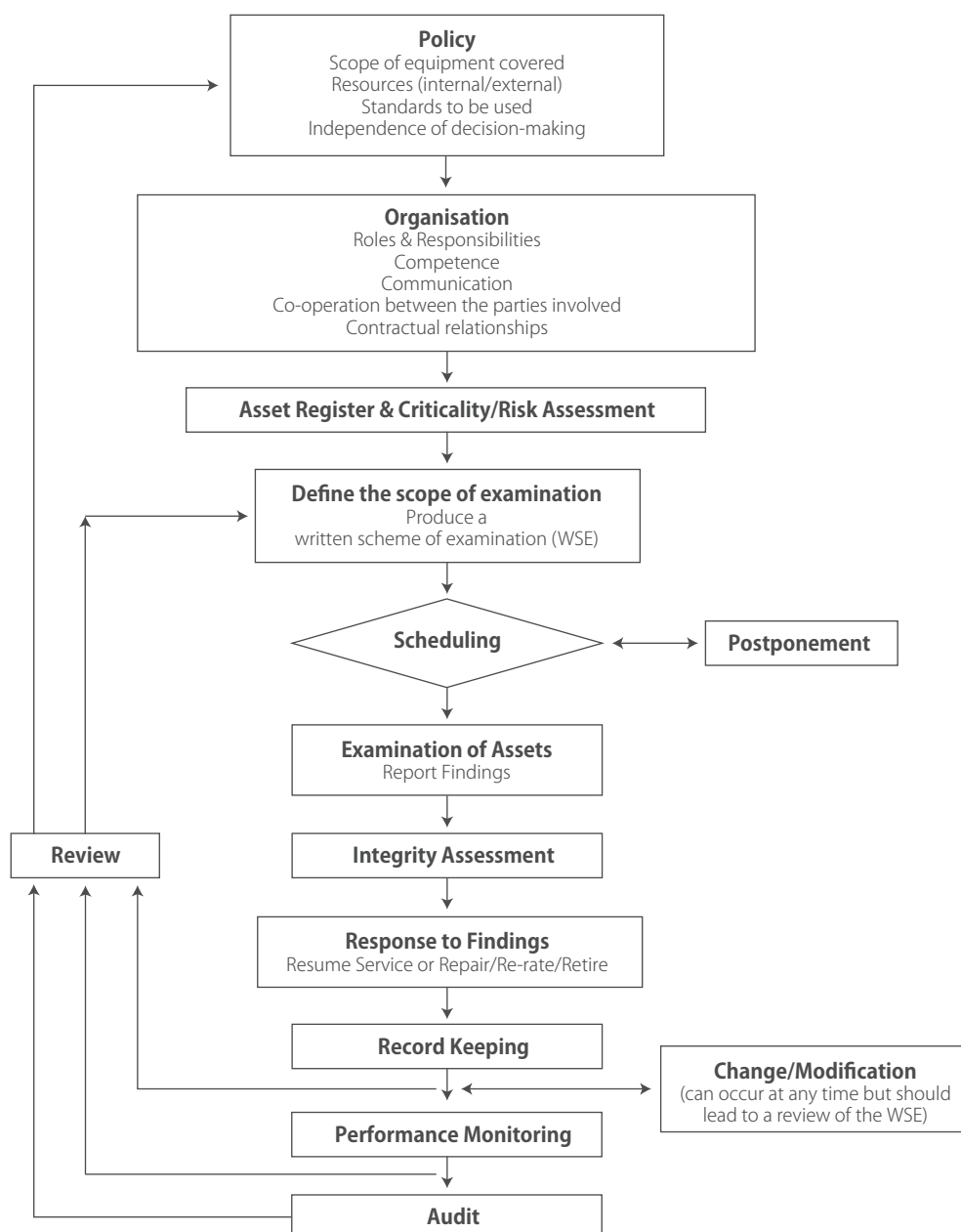


Figure 1 Flowchart taken from CDOIF Guidance on the Use of External Contractors in the Management of Ageing Plant

2.1 Policy

The inspection policy of the client organisation will depend on the relevant legislation for the materials that it is processing and its own internal systems for maintenance of the primary containment. There are a number of pieces of British legislation that affect inspection but only one that directly requires formal inspection processes.

In any workplace the primary legislation relating to the control of risks from work activities is provided by the Health & Safety at Work Act 1974⁴. Supporting the goal setting requirements of the Act are a series of regulations covering more specific aspects. Within process plants the three main sets of regulations are:

1. The Provision and Use of Work Equipment⁵ (PUWER)
2. The Control of Major Accident Hazards⁶ (COMAH - Seveso Directive)
3. The Pressure Systems Safety Regulations (PSSR)

The PSSR set down very specific ways that the primary containment shall be maintained and inspected in order to avoid the uncontrolled release of stored pressure energy but they only cover a limited set of process plant, that is, "pressure systems" as defined in the Regulations.

Inspections under PSSR are explained in some detail in the Approved Code of Practice issued by the HSE. Much of the primary containment within process plant either does not come directly under the scope of PSSR or the hazards from stored pressure energy are small in comparison with the potential consequences of escapes of flammable or toxic substances following a loss of containment.

Both PUWER and COMAH lay down general requirements that the equipment must be

maintained and inspected where necessary but they do not explicitly call for the same stringent integrity management arrangements as specified in PSSR – even though the same or more onerous arrangements may be required.

Recent guidance prepared by EEMUA and SAFed and endorsed by the HSE (EEMUA 231⁷) has shown that the inspection and maintenance regime resulting from the application of PSSR can be extended to cover all process plant containing hazardous materials. However, it should be noted that the nomenclature for specific actions may vary. For example, EEMUA 159⁸ refers to a "Specific Inspection Plan," which is equivalent to the Written Scheme of Examination referred to in the PSSR and EEMUA 231. Such a document shall be referred to as a WSE throughout the current publication.

Early in any discussions between the client and the 3rdPIB it must be made clear what level of inspection is required and which, if any, of the existing legislation and guidance is to be complied with.

2.1.1 Scope of equipment covered

In any arrangement between purchaser and supplier it is vitally important that both parties are clear of their responsibilities. This requirement is almost self-evident yet it is often the case that the arrangements fail because the two parties were not clear about who does what. This aspect of the process is given in some detail in the CDOIF guidance.

2.1.2 Factors to be considered

In those companies where there are sufficient resources available in-house to provide the expertise for inspection and integrity assessment with the required degree of independence from commercial or production pressures there is no need to bring in outside expertise. However in many instances it is necessary to employ 3rdPIBs and in those cases it is essential that there are clear and unambiguous arrangements in place to ensure that the IB provides the services necessary. The following sections define a wide range of services that might be provided by the 3rdPIB and are intended to facilitate the development of the contractual arrangements between the two organisations. It is essential to define clearly at an early stage exactly what is required of the 3rdPIB.

The development of a contract between the process plant operator and the 3rdPIB will necessarily involve a number of stages:

- What services are to be provided by the 3rdPIB?
- How will the relationship between the operator and the 3rdPIB be formalised?

2.1.2.1 Services to be provided by the 3rdPIB

3rdPIBs are often the engineering arm of insurance companies but this does not mean that inspection is necessary as part of any insurance contract. This relationship is purely historical and need have no bearing on the way that the IB operates. These bodies are able to provide all the services necessary to ensure that the integrity of the primary containment is maintained. However they cannot undertake this work in isolation and it is vital that early in any contractual negotiations personnel with a detailed understanding of the process implications are involved in the development of these arrangements.

The various stages in this system are described in detail in EEMUA 231 and cover topics such as:

- Asset register
- Equipment history
- Equipment specification
- Process hazards
- Assessment of risks/criticality
- Preparation of written schemes of examination
- Plan inspection
- Undertake inspections (including NDE if required)
- Report on inspections
- Assess suitability for future operation
- Define repairs/modifications/retirement

2.1.2.2 Resource Needed

Obviously some or all of the inspection work will be undertaken by the 3rdPIB. The inspector will follow the WSE, whoever prepared it, and will, where necessary, extend that examination or require changes to be made. He will have to liaise closely with the process personnel both to gain access to the plant and to ensure that he is aware of the current state of the plant and thus minimise risks to himself and others.

The 3rdPIB will need specialist staff and they will have to be selected based on the necessary competencies. These competencies will also have to be monitored and assessed throughout the life of any contract. It is areas such as these where accreditation to ISO 17020 will help both in the selection of suitable 3rdPIBs but also in the sale of services to potential customers. The staff will have to be available at the times that they are needed and must be able to have access to the plant that is to be inspected.

Whenever the 3rdPIB personnel have to be on site they will need a base from which to work. If they are only on site for short periods they will need