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The

Purpose, Operation & Requirements

of

The S B A

Boiler Inspection Scheme

6th Edition July 2012

**Notes for the Guidance of
Owners and Inspectors**

SBA Services Ltd.

IMPORTANT NOTES

- i. SBA SERVICES LTD. Boiler examinations under the SBA Boiler Inspection Scheme (SBA BIS) are arranged by SBA Services Ltd (SBASL) which takes every reasonable care in making the arrangements and hopes that users of the Scheme find it wholly satisfactory in meeting their boiler inspection requirements. However, users will understand that SBA Services Ltd is not (and does not hold itself out as being) qualified to be a competent person to carry out boiler examinations. Professional and technical accountability for boiler examinations carried out under the SBA BIS rests with the inspectors who carry them out and SBA Services Ltd can accept no liability for the professional and technical competence and conduct of the inspectors.
- ii. Use of the words "**require**", "**requirement**", etc., indicates an item, procedure, etc., that is mandatory under the SBA BIS.

Preface to the 6th Edition July 2012

This 6th edition includes:

- a) Restrictions for the acceptance into the SBAS Boiler Inspection Scheme of boilers using copper scantlings.
- b) Details of the Boiler Designs Approval Service.
See Appendix 5

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Administration of the Service

10. The boiler owner will contact the SBA Services (SBAS) Administrator to arrange any work.
11. The SBA Services Administrator will prepare in conjunction with the customer a Quotation Request
12. The SBA Services Administrator will contact the Nominated Competent Person & forward to him the Quotation Request with a copy to the customer.
13. The Nominated Competent Person will submit a written quotation to the SBAS Administrator & send a copy to the customer.
14. The customer will contact the SBAS Administrator to approve the quotation & request that the work proceed.
15. The SBAS Administrator will request the Nominated Competent Person in writing to proceed with the work.
16. The Competent Person will submit the approved documents to the customer, simultaneously sending an invoice & a copy of the approved documents to the SBAS Administrator.
17. The SBAS Administrator will make payment to the Competent Person & claim payment from the customer.

Charges

18. Quotations are preferred as a fixed price value, but may be given as an hourly rate with an estimated time quantity.
19. Subject to Para 20 below a fixed charge of £20 per boiler will be added to the agreed price on the invoice to the customer to cover administrative & Professional Indemnity Insurance costs.
20. Where the work is considered by SBA Services Ltd to be of value to other SBA members, SBA Services may make payment in whole or in part for the work undertaken. In such circumstance the ownership of the work will be assigned to the SBA Services Designs Library.

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APPENDIX 5.

Boiler & Pressure System Design Approval Service.

Scope

1. This service is available to SBA Members.
2. The service will provide the means for members to obtain approval for:
 - 2.1. new boiler designs
 - 2.2. existing designs where significant modifications are proposed
 - 2.3. a Written Scheme of Examination.

Principles

3. The SBA Services Ltd (SBAS) Administrator will arrange the work necessary, this will include quotation, paying the Competent Person & receiving payment from the customer.
4. A Competent Person, as defined by the Pressure Systems Safety Regulations 2000 (PSSR) Section 2(1), shall be nominated by SBA Services Ltd to ascertain the suitability of the design or Written Scheme of Examination for approval.
5. The Nominated Competent Person is insured to the sum of £10m by a reputable company. The premiums for which will be paid for by SBA Services Ltd. This cover only indemnifies the Competent Person for work undertaken resulting from a commission by SBA Services Ltd.
6. SBA Services Ltd will not be responsible for any work undertaken other than for that arranged through the SBAS Administrator.

Service Technical Standards

7. For new boilers the approval service will be to the standards prescribed in The Pressure Equipment Regulations 1999, Pressure Systems Safety Regulations 2000, BS EN12953 or other relevant legislation, Approved Codes of Practice or Guidelines, as amended. Although such Regulations excludes pressure equipment for ships (which includes small steamboats) the Regulations detail 'best practice' with recognition by most UK Authorities.
8. Repair or modifications to existing boilers will be assessed by the Competent Person who will prepare any necessary work specifications. Such work will comply with Regulation 13 (Modification & Repair) of The Pressure Systems Safety Regulations 2000. Although these Regulations exclude pressure equipment for ships (which includes small steamboats) the Regulations detail 'best practice' with recognition by most UK Authorities.
9. When a Written Scheme of Examination is called for it will be prepared in accordance with best practice detailed in The Pressure Systems Safety Regulations 2000.

1. INTRODUCTION.

- 1.1. It is SBA policy to encourage members to adopt technically sound and safe practices in the design, installation, operation and maintenance of steam plant, including particularly boilers and pressure systems.
- 1.2. In accordance with this policy it has long been and remains an SBA **requirement** that all steam boats attending SBA events must be covered by a current, valid, and satisfactory boiler examination report.
- 1.3. The purpose of Regular Routine Boiler Examinations

The purpose of having a boiler examined regularly by a competent boiler inspector is mainly to reduce as far as practicable the risks of danger from the fragmentation / explosion of the boiler pressure vessel or the connected pipe work and fittings, and from an unexpected and uncontrolled release of steam or water at high temperature and pressure, resulting from the boiler being unsatisfactory for its purpose.

The boiler inspector's main role in achieving this is to look for signs of defects in and deterioration of the boiler, and to advise the owner via the examination report of steps to be taken or restrictions to be imposed to prevent the defects leading to unacceptable risk. Typically, defects may arise as the result of ageing of the boiler, corrosion and wear and tear in service; also possibly as the result of accidental damage or unsatisfactory operating practices; occasionally up to-date knowledge will result in something which had been thought satisfactory no longer being considered acceptable.

For this process to be able to give a good assurance of safety, it is necessary for the original design and construction of a boiler to have been satisfactory for its purpose, and the boiler inspector will need to have reasonable confidence of this factor too before he can issue a report.

It goes almost without saying, that the safety of a boiler in service depends just as much on its proper operation as on its condition. Regular examinations of a boiler are likely also to assist in achieving

good general maintenance and optimum and satisfactory operation. It is not the boiler inspector's role to act as an engineering consultant for the owner as part of the BIS.

- 1.4. The purpose of the SBA Boiler Inspection Scheme is to provide a simple, satisfactory and economical method of achieving the boiler examination requirement.

Because the SBA BIS is not intended to comply with all the administrative requirements of the statutory regulations affecting the use of pressure systems at work, its use is restricted to boilers owned by SBA Members & used for private pleasure purposes only.

- 1.5. For a boiler examination report made under the SBA BIS to be "current, valid and satisfactory" and meet SBA requirements it must comply with the following definitions:-

CURRENT.

In the case of Forced Circulation Tubular Steam Generators which comply with the SBA Definition (see Appendix 3) a report of a thorough examination will be current for a period not exceeding five years, or such lesser period as the inspector states in his report, **PROVIDED THAT** the protective devices on the steam generator receive interim inspections at intervals not exceeding 26-months.

For all other boilers, the examination report will be current for a period not exceeding 14-months or such a lesser period as the inspector states in the report.

In all cases, the period of currency starts from the date of a satisfactory completion of the examination sequence, **not** from the date of the report

VALID.

An examination report issued is valid provided that:-

- The examination has been carried out by a boiler inspector carrying out an order for an examination placed by SBA Services Ltd

SAMPLE BOILER LOG
S.L Fiery Fiend Sheet no 17

DATE	OPERATING HOURS	OTHER EVENTS	REMARKS
6 April 05	5	Trip on Thames.	Boiler stored full with treated water.
7/8 May 05	15	SBA Ouse Rally, Ely	Boiler blown down from 30psi. Stored dry with plugs removed.
21/22 June 05	—	Boiler wash	Black scale removed.
7-9 July 05	—	Strip & clean for inspection.	
12 July 05	—	Cold inspection by SBAS Mr Jones.	No adverse comments, reassembled boiler.
15th July 05	2	Hot inspection by SBAS Mr Jones.	All o.k. except that pressure gauge inaccurate, to be recalibrated.
18th July 05	—	—	New pressure gauge fitted. Ref no 139478 Bourdon 3" dia 0-300psi Calibration cert. on file.
10th Nov 05	1	Winter storage.	Blown down hot from 30psi. All plugs & inspection plate removed. Pipework blown empty. Pressure gauge stored in warm

APPENDIX 4.

BOILER LOGS

The purpose of the boiler log is to provide in a convenient and accessible form:-

1. All the available documents which provide the boiler history and establish the adequacy of its design and construction.

These should include:-

Design drawings, calculations and specifications.

Makers drawings, calculations, approvals, material certificates, welding certificates, test certificates.

Similar documentation relating to modifications and repairs.
Reports of boiler examinations and tests.

2. An operating log compiled on a daily basis (when the boiler is in use, being examined, repaired etc.) Recording all the events relating to the boiler, (use of water treatment, wet or dry storage when not in steam, winter storage & frost protection etc.)

The following format is suitable. It is recommended that the log should be kept in loose leaf format.

- The boiler is operated within the limits and in accordance with any stipulations given in the report.
- Any repairs or alterations stated to be required in the report have been carried out by the specified dates and re-examined if required by the inspector.
- No other alterations or repairs have been carried out since the examination.
- Nothing has occurred since the examination was completed to cause any doubt as to the safety of the boiler for use.

SATISFACTORY.

An examination report is satisfactory if it states that the boiler is in order to be used (subject to specified conditions).

2. SBA BOILER INSPECTION SCHEME PRINCIPLES.

- 2.1. It is the intention of the SBA Boiler Inspection Scheme to apply the best current practice most appropriate for the types of boiler examined under the scheme and the circumstances of their use. Best current practice is taken to be that derived from the “ The Pressure Systems Safety Regulations 2000” and the Health & Safety Commission Approved Code of Practice “Safety of pressure systems” (2000 edition ISBN 0 7176 1767 X)
- 2.2. The great majority of steam boats owned by SBA members are operated for solely private pleasure purposes by their owners without employed crew and, as such, are not subject to any United Kingdom statutory requirements for boiler examination. A minority are operated so as to fall within the scope of the statutory regulations of the Merchant Shipping Acts, Maritime & Coastguard Agency Regulations applicable to small passenger carrying vessels, and local/harbour/navigation authority passenger vessel licensing regulations., and the SBA BIS is not suitable for these.
- 2.3. Inspectors operating under the SBA BIS are required to have regard to the circumstances of operation of each boiler and to apply best practice in the manner most appropriate to each case. They are not **required** to apply every point of the Regulations or Code of Practice

where that would not be appropriate, but they are **required** to apply the principles of the Code of Practice in every case.

3. SBA BOILER INSPECTION SCHEME ADMINISTRATION.

- 3.1. The administration of the SBA BIS will be carried out by a Scheme Administrator appointed by SBA Services Ltd. SBASL will publish from time to time the procedures for arranging boiler examinations and details of the charges for examinations. All examination work carried out under the SBA BIS will be charged at the published rates, and the charges are not negotiable.

It is important that the boiler owners and inspectors follow the published procedures in order to ensure that examinations comply with the BIS specification and scale of charges, and that they benefit from the insurance cover provided by the scheme. (see below).

- 3.2. When a request for a boiler examination is received from an SBA member, the Administrator will select a suitable and as convenient-as-possible boiler inspector, place an order for the examination with the inspector on behalf of the member, deal with receipts and payments for the examination, record and issue to the member the examination report, and deal with any “matters arising” from the examination.
- 3.3. The boiler inspectors with whom orders for examinations are placed are from a list maintained by SBASL (i.e., they are not employees of SBASL) whose qualifications and experience have been checked by SBASL, and who have agreed to carry out boiler examinations in accordance with the SBA BIS specification and at the scale of charges set by the scheme. SBASL maintains in force a policy of professional indemnity insurance which provides cover in respect of examinations carried out to orders placed by SBASL; this acts as a safeguard for inspectors and owners in the unlikely event of something going wrong.
- 3.4. Prior to the first examination of a boiler, SBASL will arrange for the basic information about it to be collected and recorded, which the boiler inspector will need at subsequent examinations (thus making future examinations simpler and quicker). This may be done at the

APPENDIX 3

SBA DEFINITION OF A “FORCED CIRCULATION TUBULAR STEAM GENERATOR” In connection with SBA BOILER RULES.

For the purpose of compliance with the SBA Boiler Rules for steam boats attending SBA events, a **forced circulation tubular steam generator is:-**

A steam generator in which the heated element is a continuous coil of tube of internal diameter not exceeding 10-mm actual size, or several such tubes operating in parallel and connected together at their water inlet and steam delivery ends. The total internal volume of the tubes (together with any components fitted to them) between the water inlet check valve and the first stop valve downstream of the last heated component shall not exceed two litres. The steam generator shall not include or have connected to it any receiver, drum, reservoir or similar, heated or unheated containing steam or hot water under pressure (this prohibition does not apply to the intrinsic components of engines driven by the boiler, nor to non-heated steam/water separators if required in the system. Boiler tubes, pipe fittings, valves, etc., shall be rated for the design working pressure and metal and steam temperatures of the steam generator.

With the exception, where essential, of water feed and steam delivery pipework, gauges and instruments, controls and protective devices, the whole of the boiler pressure system shall be confined within a casing of such form and strength that, in the event of the rupture of a tube or fitting, the hot water and steam contents of the boiler will be confined until dispersed safely up the funnel.

The boiler shall be fitted with the following as a minimum: a pressure relief valve capable of preventing the boiler pressure exceeding the design working pressure, a pressure gauge, a means of controlling the firing rate sufficient to prevent steam and metal temperatures exceeding design limits. So far as reasonably practicable, the following shall also be fitted: steam and metal temperature gauges, feed flow indicator or feed pressure gauge, protective devices to prevent steam and metal temperatures exceeding design limits.

Where generators do not comply with this definition a Design Assessment and Written Scheme of Examination prepared by a competent person is required.

SECTION 3.

NOTICE OF IMMINENT DANGER

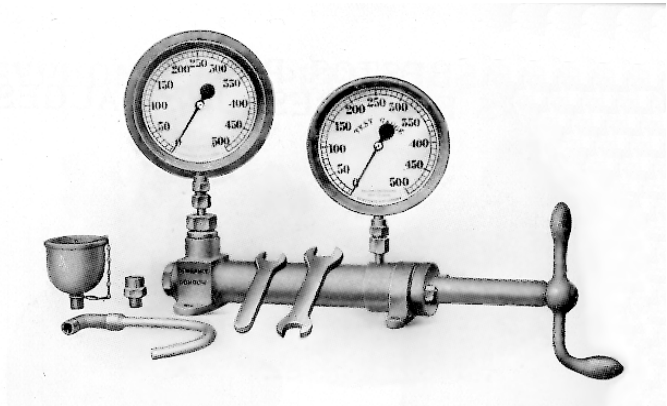
AS A RESULT OF MY EXAMINATION TODAY OF THE ABOVE BOILER I CONCLUDE THAT AN IMMINENT DANGER WOULD OCCUR IF THE BOILER WAS STEAMED AGAIN IN ITS PRESENT CONDITION.

ON NO ACCOUNT SHOULD THIS BOILER BE STEAMED AGAIN UNTIL THE DEFECTS NOTED ABOVE HAVE BEEN RECTIFIED SATISFACTORILY.

BOILER INSPECTOR NAME

DATE.....

SIGNATURE.....



same visit as the first examination or prior to that if appropriate and may be done by the boiler inspector or another competent person. The information to be gathered will include physical details of the boiler and its installation, details of its original design and construction, and of its service and inspection history.

3.5 The inspector's decisions are in all cases final on matters relating to the examination of a particular boiler and the examination report which he makes. SBASL will not enter into correspondence on these technical matters, but members should inform the company of any difficulties experienced in the operation of the scheme. (see 3.6. below)

3.6. Comments and complaints.

SBASL welcomes comments at any time on any aspect of the SBA BIS; these help the company to develop the Scheme and provide a service suited to the needs of members. Please address comments to the BIS administrator.

If a member is dissatisfied with the conduct of a particular boiler examination (in respect of either the actions of SBASL or the work of the boiler inspector), a complaint should be sent in writing addressed to the Chairman of SBASL. All written complaints will be investigated, and a written response will be made. If a complaint involves technical issues, SBASL may refer it to a technical specialist for an independent opinion.

4. SBA BOILER INSPECTION SCHEME PRACTICE.

4.1. **Acceptance Into the Scheme.**

In the case of boilers built new after 1st April 2000 evidence of certification by an independent authority will be **required**. For boilers built before that date, evidence of independent certification should be provided if available, but in its absence other appropriate evidence of satisfactory design and construction may be accepted. (See code of practice "Safety of Pressure Systems") If it is not possible to produce such evidence, the competent person **must** ask the owner to

arrange investigations, calculations or tests sufficient to establish the adequacy of the design and construction before the boiler will be accepted for examination under the SBA BIS. Such investigations do not fall within the SBA BIS nor the competent person's or inspector's duties, but they will often be able to guide owners in such matters.

4.2. **Boilers with copper scantlings.**

- (a) Any boiler with a working pressure above 100psig using copper to be accepted into the SBA Services Boiler Inspection Scheme must have a Design Assessment approved by a suitably qualified Competent Person.
- (b) Any boiler with a working pressure above 100psig requiring retubing must use a copper alloy tube material with appropriate specified elevated temperature properties in preference to copper. If it is insisted that copper is used a Design Assessment approved by a suitably qualified Competent Person is necessary.

Note:-

The following section is written in a format to provide a general scheme of examination adequate for the majority of boilers used in small steam boats when applied in conjunction with a Boiler Log.

4.3. **PRELIMINARIES.**

- (a) Before a boiler is inspected for the first time under the SBA BIS, the owner must demonstrate to a Competent Person that the acceptance criteria are compliant. Boiler owners are **required** to make this information available before a boiler will be accepted for examination.
- (b) The information to be recorded includes (subject to availability):-
 - * Name and address of owner.
 - * Name of boat in which the boiler is normally installed.
 - * Brief description of boiler and type.
 - * Maker and maker's serial number.
 - * Maker's original test pressure.
 - * Original design maximum working pressure.
 - * Details of original (and/or subsequent) design and construction

APPENDIX 2

HAZARDOUS BOILER NOTICE

Notes for boiler inspector

- (a) This notice is to be completed in triplicate immediately on site if you believe as a result of your examination of a boiler that an imminent danger would occur if the boiler was steamed again in its present condition.
- (b) One copy is to be given immediately to the boiler owner/agent on site together with oral advice not to steam the boiler again until defects have been rectified.
- (c) One copy to be sent to the SBA BIS Administrator.
- (d) One copy for you to retain.

SECTION 1. DETAILS OF BOILER AND OWNER

- 1.1 **Name and address of boiler owner:-**
- 1.2. **Name of boat which boiler is installed:-**
- 1.3. **Name of boiler maker and maker's serial number;-**

SECTION 2.

DETAILS OF EXAMINATION/ TEST

- 2.1. **Date of examination/test:-**
- 2.2. **Type of examination/test:-**
- 2.3. **Brief details of defects found:**

APPENDIX 1

Examination Report Forms.

Four types of report form are used by an inspector, they are divided into those used when the boiler is new to the scheme & those used for repeat examinations. They are as follows :

- (a) Small Tubular Steam Generators new to the scheme.
- (b) Small Tubular Steam Generators repeat examination.
- (c) Conventional Boiler new to scheme.
- (d) Conventional Boiler repeat examination.

When a boiler is new to the scheme section 5 of the report form (a & c above) **requires** that the inspector verifies **that the original design & construction are suitable for purpose.**

Issue of these report forms indicates that the requirements of Purpose Operation & Requirements of the SBAS BIS Section 4.1 have been satisfied.

The forms are available for examination from the BIS Administrator.

assessments and certification.

- * Brief details of inspection and maintenance history.
- * Date of latest examination report and permissible maximum working pressure specified in that.
- * Date of the most recent hydraulic test, test pressure, and result of that test.
- * Existence (or otherwise) of a written scheme of examination for the boiler.
- * Existence (or otherwise) of a boiler log.
- * Any other information available relevant to the boiler and its future examination.

The competent person is **required** also to satisfy himself as to the adequacy for its purpose of the design and construction of the boiler. In the case of a small tubular steam generator for which an examination interval in excess of 14-months is sought, the competent person is **required** to satisfy himself that the steam generator complies with the SBA Definition (see Appendix 3), and to record this fact, if dismantling is needed to establish this (ie, if the details are not present in the boiler documentation), this check may alternatively be carried out by the boiler inspector at the first (cold) examination.

- (c) In most cases the provision of a Written Scheme of Examination specifically for individual boilers should not be needed, but this is for the boiler inspector to decide.
If **required** the Written Scheme of Examination should detail the procedures to be adopted for the periodic examination of a particular boiler and its attachments. This requirement is likely to be applied only to the larger or more complex types of boiler. The inspector may decline to carry out an examination until a satisfactory scheme of examination has been produced. Reference to the H&SC Code of Practice is recommended before drawing up a written scheme of examination.
- (d) The boiler owner/operator is **required** to maintain up to date a log for each boiler subject to the SBA BIS. The log is to contain all available documentation relating to the design, construction, initial testing and certification, modification, repair, operation, and inspection of the boiler over its whole existence. (See Appendix 4). The boiler log **must** be produced to the boiler inspector at each examination. The boiler inspector is **required** to check the boiler log

at each examination, initial and date the latest entry(ies), and record so doing in the examination report.

- (e) The inspector is **required** to see and check the last previous examination report (or initial test certificates in the case of a new boiler) and record having done so in the examination report. If the last previous examination report (or initial test certificates) cannot be produced the inspector may, if he considers it necessary, ask for investigations to be carried out as in 4.1(a) above.
- (f) BIS users are strongly advised to consult the inspector well in advance of the date of an examination to exchange information on the boiler and the inspector's directions for preparation and examinations. Failure to do this could result in avoidable expense and delay, and it is emphasised that it is entirely for the inspector to decide the extent and detail of the preparation, examinations and tests which should be carried out.

4.3. **PREPARATION.**

- (a) The boiler owner is **required** to ensure that the boiler is prepared for examinations as directed by the inspector.
- (b) The following preparations should be regarded as the minimum **requirement** unless directed otherwise by your inspector:-
 - .. Drain the boiler and associated pipe work.
 - .. Open or take off all fireside access doors, inspection plates and smoke box doors.
 - .. Remove all unspent fuel, soot and ash from the firebox, smoke box and ashpan.
 - .. Clean fire tubes internally.
 - .. Clean all accessible fireside spaces and surfaces.
 - .. Open or take off all manholes, hand holes, drum ends, inspection plugs, etc., giving access to or allowing inspection of waterside spaces and surfaces.
 - .. Clean all accessible waterside spaces and surfaces.
 - .. Clean all water tubes internally insofar as is practicable.
 - .. Open up and dismantle the safety valve (s), water level gauge (s), main steam stop valve (s), blow-down valve (s) and water inlet

(b) **FORMAL EXAMINATION REPORTS.**

The inspector is **required** within 28 days of the completion of the examination sequence (see 4.5(c) for incomplete examinations) to complete and despatch a formal written examination report. The report is to be completed on the standard SBA BIS pro-forma (see Appendix 1) together with additional sheets if needed. The inspector is required to complete all sections of the report pro-forma, entering "not applicable", etc, where that is appropriate. If a **Hazardous Boiler Notice** has been issued, a copy is **required** to be attached to the examination report (whether the boiler has since been repaired or not). The report is to be sent to the SBA BIS Administrator who will register it and forward one copy to the boiler owner, and one to the inspector.

(c) **INCOMPLETE EXAMINATIONS.**

In the event that the boiler owner has not made the necessary arrangements for the full examination sequence to be completed within 60 days of the first examination, the inspector is **required** (unless he has agreed special arrangements with the owner) to issue a formal written examination report on the SBA BIS standard pro-forma with sections completed as "not carried out" or "not examined" as necessary, and stating that the boiler is "not in order to be used". Inspectors are guided not to agree to extended examination sequences unless there are sound technical reasons for them (for instance when major repairs have been found to be needed which will be examined on completion); in particular, inspectors should not agree to an arrangement which would result in a boiler's being unexamined for a long period before the examination in steam; the only exception to this could be in the case of newly manufactured boilers which have never been filled with water. Once a report for an incomplete examination has been issued, the full examination sequence **must** be repeated before a further report may be issued.

(d) **REPORT ARCHIVE.**

The SBA BIS Administrator is **required** to maintain a confidential archive of all reports issued under the SBA Boiler Inspection Scheme. Copies of reports are required to be made available solely to the owner for the time being of the boiler to which the reports refer unless otherwise required by law.

decline to have such additional examination(s) carried out, in which case the inspector is **required** to issue a report for an incomplete examination (see 4.4(c) below).

4.5. **EXAMINATION RESULTS.**

(a) **ON-SITE REPORTS.**

The inspector is required to report to the owner (or his/her agent) the results of the examination before leaving the site, as follows:-

IN ORDER.

If the boiler is in order, the inspector will inform the owner orally that it may be prepared for the next examination or, following the examination in steam, that it may be put into service without awaiting receipt of the written examination report.

DEFECTS.

If defects have been found during the examination, the inspector will inform the owner orally of their nature and what is needed for their rectification (in general terms - the inspector is not required to give a detailed specification for repairs). He will inform the owner whether rectification is necessary before the boiler is next steamed, or before a particular date or, if after the first examination, before the second examination; and whether the repairs should be examined by a competent inspector during repairs and/or on completion.

IMMINENT DANGER.

If as a result of the examination the inspector concludes that an imminent danger would occur if the boiler was steamed again in its present condition, he is **required** to inform the owner orally of the defects (as above) and also advise him/her that the boiler should on no account be steamed until the defects have been rectified. In addition to this oral notification, the inspector is **required** also to complete immediately on site all sections of a "**HAZARDOUS BOILER NOTICE**" on the standard SBA BIS pro-forma (see Appendix 2) in triplicate; the top copy to be handed immediately to the owner or his agent on site, the second copy to be sent to the SBA BIS Administrator, the third to be retained by the inspector for future use.

check valve (s).

- (c) The site of the boiler should be made clear of obstructions and safe and easy access provided to all parts of the boiler which the inspector is likely to wish to examine. Good lighting should be provided.
- (d) The boiler inspector is **required** to decline to continue with an examination if the boiler has been inadequately prepared or safe access is not available.

4.4. **ON-SITE EXAMINATIONS.**

- (a) A minimum of two examinations of the boiler are **required** before a report may be issued; both may be carried out as a continuous operation if that is practicable. A hydraulic pressure test may also be needed.
- (b) It is a **requirement** that the owner of the boiler (or his duly authorised agent) shall be present with the inspector during the whole of every examination, together with such additional persons as may be necessary to assist the inspector in the conduct of the examination, and the boiler inspector is **required** to decline to carry out an examination in absence of the owner/agent.

It is important that at least one person present with the owner (if not the owner him/herself) should have sufficient technical competence to understand and interpret the inspector's instructions and recommendations.

- (c) The first examination is **required** to be carried out with the boiler cold, empty and prepared as directed by the inspector but in any event to the minimum **requirements** given in 4.3(b) above. At this examination the inspector is **required** to carry out the following as a minimum, together with such other inspections and tests as he considers appropriate and necessary:-
 - Check the integrity of the pressure vessel(s) and associated pipe work and valves including superheater(s) and economiser(s).
 - Check the integrity of the boiler framing, settings, brickwork (including fire-brickwork), insulation, casing and cladding.
 - Check all parts for wear and corrosion.

- ... Check specifically the condition of safety valve(s), pressure gauge(s), water level gauge(s), main steam stop valve(s), blow-down valve(s), water inlet check valve(s).
 - ... Check, where practicable by rodding through, that the water passages of the water level gauge(s) are unobstructed and that the gauge glass isolating and blow-down cocks operate correctly.
 - ... Check that the pressure gauge(s) is/are marked with a red line at the correct maximum permissible working pressure of the boiler, and that the safety valve(s) is/are marked with an operating pressure no higher than this.
 - ... Consider the adequacy of the boiler feed water supply arrangements.
 - ... Consider the possible need for annealing of copper pressure pipework connected to the boiler.
 - ... Consider any other factors affecting the safe operation of the boiler.
- (d) The second examination is **required** to be carried out with the boiler fully reassembled and under normal steam pressure. It is **required** that the boiler should be fired for the test as for normal service and that the pressure should be raised so as to lift the safety valve(s). At this examination the inspector is **required** to carry out the following as a minimum, together with such other inspections and tests as he considers appropriate and necessary:-
- .. Check visually for correct assembly of all components, giving particular attention to the fitting of access doors, drum ends, flanged connections, manholes, and pipe joints.
 - .. Check the correct operation of main steam stop valve(s), blow-down valve(s), water inlet check valve(s), pressure gauge(s), gauge glass isolating and blow-down cocks.
 - .. Check that the operation of the safety valve(s) controls steam pressure to within an acceptable margin of the specified maximum permissible working pressure.
 - ... Check the operation of at least one means of supplying feed water to the boiler.
 - .. Check visually for steam and water leaks.
 - ... Consider any other factors affecting the safety of operation of the boiler.

- (e) If a hydraulic test of the boiler is needed it should be carried out after the boiler has been reassembled following the first examination but before the boiler is next steamed. It is a **requirement** that all boilers must be hydraulically tested at intervals not exceeding 10 years or more frequently as the inspector considers necessary. The hydraulic test pressure is **required** to be 1½ times the maximum permissible working pressure which the inspector has specified following the first examination, or to such other pressure as the inspector determines. The hydraulic test pressure is **required** to be maintained for a minimum continuous period of 20 minutes or such longer period or periods as the inspector may instruct. Subject to the agreement of the inspector, minor loss of pressure (as from a weeping "closed" valve) may be made up during the test, but the test will be invalidated by any major pressure loss, the cause of which must be found and rectified before repeating the test. The inspector is **required** to examine repeatedly during the test all accessible parts of the boiler and report all leaks which are caused by defects.
- (f) In the case of small tubular steam generators with an interval between thorough examinations in excess of 14-months, an interim inspection of the boiler protective devices is **required** at intervals not exceeding 26-months. At these interim examinations the inspector is **required** to carry out the following as a minimum, together with any other inspections and tests as he considers appropriate and necessary:-
- Check the the condition and correct operation of the pressure relief valve, the steam pressure gauge, and the means of controlling the firing rate to prevent excessive temperature; check also such other protective devices as may be fitted, such as temperature gauges and temperature limiters, feed flow and /or pressure gauges. These checks to be carried out: (a) Cold, with the items dismantled to the extent required by the inspector, and (b) under normal steam pressure.
- (g) The inspector is **required** to ask for additional examinations to be carried out to repeat either the first or the second examinations or the hydraulic test if this appears to him to be necessary for the proper completion of the examination sequence. This could occur as the result of inadequate preparation by the owner, or following the discovery of defects needing rectification and re-examination before proceeding to the next stage of the the examination sequence, or if necessary for it to be possible to issue a satisfactory examination report. The owner may