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BICS-INSPECTION

About us:

In international construction and engineering industry, qualified and experienced staff determines whether a project will be successful completed. We have made it to our mission to provide the industry internally trained staff, and thereby contribute to the success of our Clients tasks and projects.

BODE INDUSTRIAL & CONSULTANT SERVICES LTD.(short BICS) has the qualified staff of the respective industries for your demanding tasks and projects in the workshop or on the construction site.

With more than 25 years of worldwide experience in the workshops and on the construction sites we do not belong to the largest, but to the most specialized companies on the market.

On request we will present you a general agreement, so you can secure your project plans with qualified personnel according to your needs.

We will gladly send you additional information regarding our reporting system and our internal training.

For further information and inquiries, please feel free to contact us at any time.

We look forward to a successful collaboration.

Sincerely from Xiamen, P.R. China



Dipl. Ing. Carsten Bode

SFI / EWE / IWE
Level – 3 (UT / MT / PT)
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Field of activities:

• Fabrication Supervision

The fabrication supervision of components demands from the fabrication supervisor a high level of technical understanding and experience. In addition to the technical skills, coordination skills, staff management, cost control and meeting deadlines are essential.

• Welding Supervision (CWE / EWE / IWE)

Welding Supervisor have a high degree of responsibility. They ensure that even critical components such as pressure vessels or appliances can be operated safely. Extensive knowledge in welding techniques in different materials is therefore essential.

CWE = Certified Welding Engineer
EWE = European Welding Engineer
IWE = International Welding Engineer

• Non-Destructive Testing NDT (Level II & III ASNT) (UT / MT / PT / RT / VT)

Non-destructive testing is usually performed, when a component or its critical components are exposed to a particular strain. A distinction is made between surface examination of the components to be tested and a volume test, in which the entire volume of a critical component is inspected.

The most commonly used NDT methods are:

- UT (Ultrasonic Testing) [volume inspection]
- RT (Radiographic Testing) [volume inspection]
- MT (Magnetic Particle Testing) [surface inspection]
- PT (Dye Penetrant Testing) [surface inspection]
- VT (Visual Testing) [surface inspection]

Depending on the material, type of construction and shape, the appropriate NDT methods are chosen for the object to be tested.

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• NDT Training (Level I & Level II, ASNT) (UT / MT / PT / VT)

Training is necessary to be permitted to perform non-destructive testing. This training is divided in three levels. The training in Europe is in accordance with DIN EN 473 and in North America in accordance with ASNT (= ASNT American Society of Non-Destructive Testing)

Both training programs are comparable. The main differences between each test level are as shown below.

Level 1 inspector has a basic training.

Level 2 inspector is approved to test and evaluate.

Level 3 inspector is entitled to create test procedures.

• NDT Consulting

In order to achieve maximum safety with respect to component failure for the object to be tested, in many cases a non-destructive testing is necessary. Since not every test method is appropriate for every task, it is useful to consult experts in this regard, so that maximum safety of your components can be achieved.

• Technical Inspections

The term technical inspection refers to the inspection of a technical component or group of components. The inspection can be conducted at the start, during and/or after completion of the component. Technical inspections are conducted for instance for the following components:

- Pressure vessels
- Valves & pumps
- Tanks & vacuum containers
- Pipes & fittings
- Castings & forgings
- Machine components
- Structural steel
- etc.

Since large projects consist of many different components, which are bought from different companies and countries, technical inspections prior to installation or use of components are recommend.

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• Company Audits

Whether a company is qualified for the assigned task, can only be assessed by a detailed audit. In addition to the required certificates and approvals, the conditions in the workshops must also satisfy the requirements. Naturally this also applies to the qualifications of the employees of the company being audited.

• Quality Assurance QA / QC / QM

Quality assurance is divided into three areas.

QA = Quality Assurance

QC = Quality Control

QM = Quality Management

Only when these three areas are perfectly coordinated, one speaks of a coordinated quality assurance.

• Expediting & Cost Control

Since for nearly all projects exceeding the contractually agreed delivery deadlines results in a contractual penalty, expediting and cost control is more than justified. The expediting monitors the progress of the respective trades and components in the workshop, and if necessary, can take the necessary corrective actions. In this regard cost control works closely together with the expediting, and ensures that the project cost does not overdraw the internal company's budget.

• Authorized Experts Services

In addition to determining the cause of damage, the most economical repair option, expected repair costs and other relevant values, such as the replacement value and the residual value of a component are determined. Moreover authorized technical expert opinions are used to determine the cause of damages, which have occurred. In the case of a legal dispute, authorized technical expert opinions are used as a basis for assessing the causation and the amount of the incurred damages.

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Industrial Areas:

• Pressure Vessels & Apparatus Engineering

In addition to conventional materials such as stainless steel and carbon steel, we perform fabrication supervision / welding supervision and non-destructive testing of pressure vessels and appliances even for special material grades, such as:

- P5 / P9 / P11 / P22
- P91 / P92
- Titanium
- Zirconium
- Tantalum



• Chemical & Petrochemical Industry

Chemical and petrochemical plants consist of a number of pressure vessels, pipes, valves, pumps, fittings, etc. Only specialized personnel are able to accompany this complex matter in the construction phase. Site personnel must be able to demonstrate sound knowledge, not only for technical drawings but also for Isometrics and PID charts.

In addition to the high technical requirements of the site personnel, also management skills are required.



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• Energy- & Power Plants

High security requirements are demanded from power plant components. The special requirements for the production control and supervision of the welding of safety-related components, such as steam pipes / safety valves / pumps, etc. meet the highest standards.



• Castings & Forgings

Castings and forgings are often used in heavy mechanical engineering. The manufacturing process of castings is accompanied by a series of heat treatments in order to reduce the internal stress in the structure. The heat treatment can form cracks in the inner and outer region of the casting. Therefore, before and after any heat treatment castings are subjected to a NDT test.



Forgings are no less critical. Depending on the degree of deformation, the components can tear in the inner and in the outer region. Therefore, appropriate NDT tests are carried out on forgings.



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• Machinery & Plant Construction

The machinery & plant construction covers a broad field. Therefore, we mention here just a few examples:

- Machine components
- Valves (with and without actuator)
- Pumps
- Pipes & fittings
- Tanks
- Vessels (pressure / vacuum)
- etc.



• Structural Steel

Structural steel is used in almost all projects of major plant construction. The use of constructional steelwork ranges from simple hall construction to complex welded construction. As an example the following steel construction types are mentioned.

- Steel framework
- Bridge construction
- Hydraulic steel structures
- Crane construction



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• Mining Industry

The equipment of the mining industry belongs to the largest machines in the world. The respective equipment consists of welded constructions, machine components, electrical, hydraulic and pneumatic actuators. In addition to the components already mentioned, there are also a large number of castings and forgings in mining machineries.

The wide variety of different components demands from the manufacturing supervisor and from the welding supervisor comprehensive technical knowledge.



• Cement Industry

Critical components such as the grinding drum are subject to a heavy load during operation. Therefore, the grinding drums and other critical components are supervised with regard to welding technology during the production phase, and later subjected to non-destructive testing.



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NDT Training:

The training for non-destructive tester takes place in three stages as described below. Training for the NDT inspector follows the rules of the ASNT. (ASNT = American Society of Non-Destructive Testing)

Level 1 - training: In Level 1 training, the student is taught the physical basic knowledge in relation to the respective test method. In addition to the basic knowledge the student is introduced to the methods of calibration of the respective test method. A Level-1 examiner is only permitted to conduct simple NDT tests by himself in the related method.

Level 2 - training: In Level 2 training, the student is taught knowledge of the respective types of production, welding procedures, testing standards and other skills. After successful examination, a Level-2 Examiner is permitted to conduct even complex NDT test by himself in the related method.

Level 3 Training: In Level 3 training, the student gets trained to be able to provide a Level 2 examiner a detailed procedure for a specific testing assignment. In addition a Level-3 student gets deeper theoretical knowledge of further advanced testing methods in his related method

UT Level 1: 5 days theoretical training, 1 day practical training
Theoretical- & practical examination
Training priority: Theoretical Knowledge / Calibration

UT Level 2: 5 days theoretical training
Theoretical examination
Training priority: Welds / Pipes / Castings / Forgings

UT Level 3: 5 days theoretical training
Theoretical examination
Training priority: Immersion testing / Lense-systems

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MT Level 1:	4 days theoretical training, 1 day practical training Theoretical- & practical examination Training priority: Theoretical Knowledge
MT Level 2:	3 days theoretical training Theoretical examination Training priority: Welds / Pipes / Castings / Forgings
MT Level 3:	2 days theoretical training, Theoretical examination Training priority: Resulting Magnetic Fields
PT Level 1:	2,5 days theoretical training, 0,5 days practical training Theoretical- & practical examination Training priority: Theoretical Knowledge
PT Level 2:	2 days theoretical training Theoretical examination Training priority: Welds / Pipes / Castings / Forgings
PT Level 3:	2 days theoretical training Theoretical examination Training priority: Composites / Ceramics / Extrusions
VT Level 1:	2 days theoretical training Theoretical examination Training priority: Theoretical Knowledge
VT Level 2:	2 days theoretical training Theoretical examination Training priority: Welds / Pipes / Castings / Forgings
VT Level 2:	2 days theoretical training Theoretical examination Training priority: Composites / Ceramics / Extrusions

Upon request we will be glad to send you further information material (CD-ROM or USB) regarding our NDT training. Training dates as agreed upon.

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NDT Testing:

UT (Ultrasonic Testing)

Ultrasonic tests are conducted by us worldwide. We will test your site components for you. We have the necessary equipment and accessories, with which we can also test large components. Following the testing, we will create a meaningful test report.

MT (Magnetic Particle Testing)

Magnetic particle tests are conducted by us worldwide, or monitored by us on site. We have the necessary equipment and accessories, with which we can test any appropriate components. Following the testing, we will create a meaningful test report.

PT (Dye Penetrant Testing)

Penetrant tests are conducted by us worldwide, or monitored by us on site. We have the necessary accessories with which we can test any appropriate components. Following the testing, we will create a meaningful test report.

VT (Visual Testing)

Visual tests are also conducted by us worldwide. With the help of electronic instruments, such as endoscopes (with recording function) we can send you the result via video on the same day. Following the testing, we will create a meaningful test report.

RT (Radiographic Testing)

We supervise radiographic tests for you worldwide on site. Besides supervising the radiographic test, we can evaluate the radiographic films for you. Following the testing, we will create a meaningful report.

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Authorized Experts Services:

The tasks of an authorized expert are:

- **Determine the cause of damage**
Causation test (cause-effect)
(technical failure)
(human error)
(sabotage)
- **Determining the cost of repair**
If the damage in relation to the new acquisition represents only a small portion, the repair costs are determined.
- **Determining residual value**
If a repair from a financial or technical point of view is not useful, the expert determines the replacement value, or the residual value of the tested object.
- **Creating expert opinions**
A usable certificate is a certificate, which will stand up in court.



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Reference-List (extract):

Client: ThyssenKrupp Industrial Solutions

Activity: Fabrication Supervision / Welding Supervision / NDT

Industry: Structural Steel / Mining Industry / Mobile Crusher

Country: Turkey

Client: Uhde

Activity: Inspection / Expediting / Welding Supervision

Industry: Chemical- & Petrochemical Industry

Country: Europe / China / Middle East

Client: HATCH

Activity: Fabrication Supervision / Welding Supervision / NDT

Industry: Structural Steel, Pressure Vessels & Tanks

Country: China

Client: Fluor

Activity: Welding Supervision / NDT

Industry: Pressure Vessels & Tanks

Country: Japan

Client: Bechtel

Activity: Inspection / Welding Supervision / NDT

Industry: Structural Steel

Country: South-Korea

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Client: ThyssenKrupp Industrial Solutions

Activity: Fabrication Supervision / Welding Supervision / NDT

Industry: Mining-Industry

Country: China / Europe

Client: Goodtech

Activity: Inspection / Expediting

Industry: Machine- & Plant Construction

Country: Norway

Client: Halliburton

Activity: Inspection / Expediting / NDT

Industry: Structural Steel

Country: Thailand

Client: ThyssenKrupp Industrial Solutions

Activity: Fabrication Supervision / Welding Supervision / NDT

Industry: Mining-Industry / Bucket Wheel Excavator

Country: Serbia

Client: Valve Enterprise

Activity: Inspection / Expediting / NDT

Industry: Machine- & Plant Construction

Country: China / Japan

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Client: Paul Wurth

Activity: Fabrication Supervision / Welding Supervision / NDT

Industry: Structural Steel

Country: Thailand

Client: Eriks Valves

Activity: Inspection / NDT

Industry: Machine- & Plant Construction

Country: China

Client: KHD Humboldt Wedag

Activity: Inspections / NDT

Industry: Drums & Shafts for Cement Plants

Country: China

Client: TYCO International

Activity: Inspections / NDT

Industry: High Pressure Valves

Country: China

Client: Bechtel

Activity: Inspection / Welding Supervision / NDT

Industry: Chemical- & Petrochemical Industry

Country: South-Korea

BICS-INSPECTION

Client: ThyssenKrupp Industrial Solutions

Activity: Fabrication Supervision / Welding Supervision / NDT

Industry: Cement Industry

Country: China

Client: HATCH

Activity: Fabrication Supervision / Welding Supervision / NDT

Industry: Structural Steel

Country: China