

# Our Professional Welders Are Honing Their Skills to Become World-Class Welders

**In this era of automation, we firmly cling to workmen's skills and manufacturing that makes our customers feel reassured**

In our technical training center, which is independent from other organizations and has been renovated in terms of equipment, facilities, and training programs, young welders are trying hard to learn skills from veteran welders and veteran welders are aiming for world-class welding skills.



New technical training center



Tubular reactor, a typical product of Yokohama Nuclear & Chemical Components Works

## **A day at the technical training center**

IHI's Yokohama Nuclear & Chemical Components Works produces nuclear and chemical plant equipment as its core

products. This plant is a world-leading factory that excels at producing large pressure vessels with wall thicknesses of over 200 mm and masses of over 2 000 tons, and has been offering high-quality equipment both domestically and

overseas for over 40 years.

IHI's welders, who have the most advanced skills, are essential in producing these products. Let's take a look at how they train.

### New employee

I joined IHI in April, and now it passed two months, I have been taking safety training, welding training, and other training courses, been paid to do so, and am beginning to feel less like a student and more like a productive member of society. Recently, I have been making sparks fly from morning to night to get certified as a welder through JIS (Japanese Industrial Standards), which is the first qualification I am required to acquire. Today, I had a rehearsal in the presence of my bosses and experienced welders. With their support and encouragement, I am working hard to keep



New employee training



New employee training booths

my part of the promise I made with the 10 fellow trainees who joined this company the same year. We promised each other that we would all obtain the qualification.

I heard that last year, new employees performed cold water ablutions in a waterfall at their training camp. This year's new employees are looking forward to joining the training camp, hoping to bond and deepen our sense of unity.

### Mid-level welder

Welding for actual products requires many advanced skills, some of which cannot be learned from textbooks. Before such welding, having a lot of practice to brush up my skills is important. I practiced welding special materials, bent joints and welding in a small space over and over again and now I am becoming more and more confident that I can weld anything.

### Young welder who entered a welding skills contest

Last year, I won an excellence award at Kanagawa Prefecture's welding skills contest, but was far from winning first place. I swore to myself that I would enter the contest again. For the second year in a row, I have qualified to enter the prefectural contest. Now, I'm trying hard to overcome my weaknesses to win first place in the prefectural contest and then the national welding skills contest. I am confident and look forward to the contests.

### Instructor (Foreman)

Welders of different levels each with their own goals visit this training center. I am always thinking about how I, as a veteran welder, can pass my skills down to these welders. In order to do so, I always try to understand their personalities and habits and provide training appropriate to each individual.

I coached a young welder who had difficulty welding in small spaces. I was able to experience the joy only a teacher knows when I heard he passed the qualification test.



Welding qualification training in a small space



Samples welded by the winner of the welding skills contest



Contestant being given advice by an instructor



Veteran welder coaching a young welder

## Goals of this technical training center

This technical training center, where these welders are training, was opened in a new building last year. It was made independent from other organizations in 2011 and has its own staff.

This technical training center provides various trainings as described below, with the aim of developing welders, improving welding technology, and improving welded product quality. The center provides every form of support to achieve this aim. For example, air conditioners were provided at the training site so that welders can practice to

their heart's content, without worrying about heat stroke. In addition, they are urged to thoroughly practice 5S (*Seiri* (tidiness), *Seiton* (orderliness), *Seiso* (sweep), *Seiketsu* (cleanliness), *Shitsuke* (discipline)) to keep the training environment tidy and clean so that they can concentrate on their training.

### (1) Enhancing customer trust with improved welding quality

Providing various kinds of training and tangible and intangible support means improving the QCD (Quality, Cost, Delivery) of the final product. The primary goal of our training and support is to reduce the defect rate through qualification training, special pre-training, and feedback on defects, in order to stabilize schedule and cost and obtain customer trust.

Special pre-training is provided for sharing lessons learned and know-how is provided for carrying out welding work that welders typically have difficulty with to prevent problems with similar types of welding.

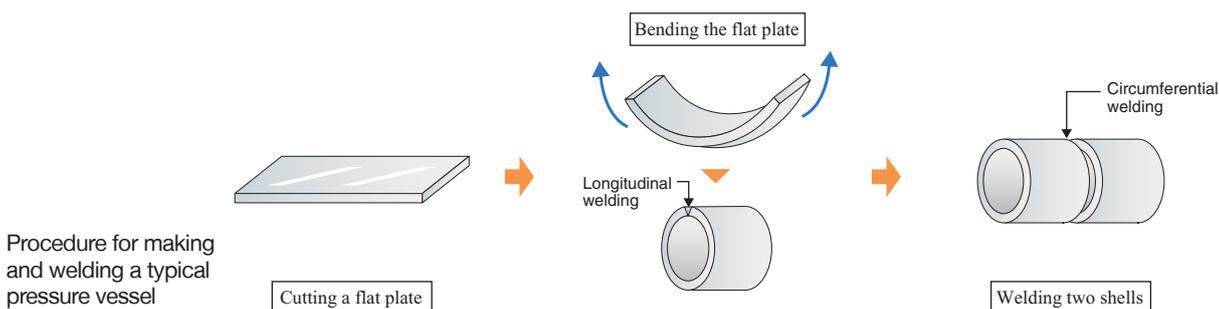
This center arranges training to prepare for never-before-seen welding work in order to contribute to improving product quality and customer satisfaction.

### (2) Continually developing the best welders in Japan

Over the past 15 years, this plant has won first place at the national welding skills contest nine times and second place three times. In addition, this plant won first place in the category of thick plates at the national boiler welding contest in 2012 and won the Minister of Health, Labour and Welfare Award. The results for this year (2013) are out with the plant winning first place in the two categories of thick plates and medium plates at the same national boiler welding contest. In addition, this plant won first place at Kanagawa Prefecture's welding skills contest, which means this plant has won first place three times in one year. We will keep striving to establish the reputation of IHI's welders as "The best welders in Japan."

### (3) Keeping the new employee retention rate high

To be honest, welding is hard work. In new employee training, new employees are given guidance from veteran welders to develop various skills, so they can sense their own growth everyday even though the training is tough. This helps develop a feeling of unity among those who joined the company at the same time





Left: Chairperson of Japan Boiler Association Award  
Right: Minister of Health, Labour and Welfare Award

and it helps keep the retention rate of these highly skilled “rookies” high.

#### (4) Developing other technicians and engineers

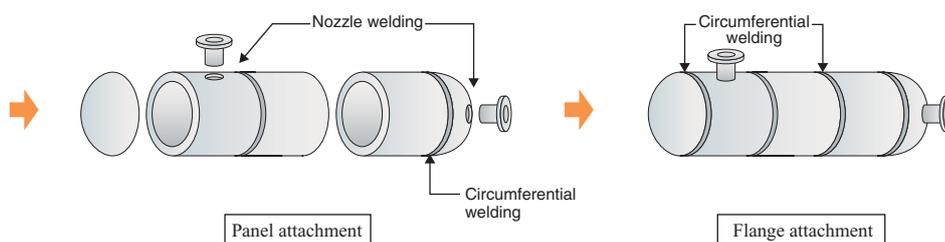
In Yokohama Nuclear & Chemical Components Works, welding is the most important skill, but other skills are also required to ensure product quality. One of the trainings this technical training center provides is training for national qualification for machining technicians. In addition, this center provides education on welding engineering and ASME (American Society of Mechanical Engineers) standards for engineers for welding technology, which constitutes the foundation of the skills used on-site.

### To meet increasingly diversified needs

This new training center has just been established, but is already developing highly skilled welders with its excellent training. Yokohama Nuclear & Chemical Components Works plans to expand its product lineup, and therefore, this training center will work to respond to increasingly diversified needs.

By integrating training on machining and measurement with the training on welding, this training center will become a comprehensive training center in the Yokohama area for IHI.

The need to improve the skills of local welders is



### Virtual welding simulator



I am an employee of IHI. I am female and I graduated with an arts degree. My image of welding was bright lights and loud noises with enough heat to melt iron, yet I was able to experience welding work.

Holding the torch, which contains the welding electrode, with my right hand, I pull the mask over my head to protect my eyes from the bright welding arc, but I can see nothing but pitch black darkness. I wonder whether the world of welding exists in such darkness. The thought fills me with anxiety. The moment I touch the electrode to the iron plate, only a small area around the contact point lights up with the light of the welding arc. The torch vibrates and makes a crackling sound. “Wow, this is welding!” My image turns into reality in an instant. Holding my breath, I concentrate my gaze at the tip of the electrode, but it moves randomly forming a zigzagged line like a snake.

“Hmm...” I don’t feel any heat or smell anything from the melting electrode. “Amazing!” I experienced this in a virtual world created by the welding technical training center’s virtual training system, which does not require the use of protective equipment such as work clothes, gloves, or helmets. Anyone can safely experience welding in just a few moments.

Why don’t you try it when you visit our plant?

increasing, especially because of increasing orders for overseas plants. We will expand our business overseas through globalized training by accepting more trainee welders from other countries.

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