

**Barsebäck NPP in Sweden – Transition to Decommissioning  
Socio-Economic Aspects of Decommissioning  
What Did We Achieve During the Transition 1997-2008? – 9092**

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**ABSTRACT**

Barsebäck 1 and 2, type BWR (Boiling Water Reactor) with a capacity of 615 MWe was closed down permanently on 30 November 1999 respective 31 May 2005 due to political decision. Both units together have been in Service operation (Care and maintenance) since 1 December 2006.

Barsebäck NPP will stay in Service operation until beginning of 2018 when dismantling operation begins with the aim of a free-realized site in the beginning of 2025. That means that the remaining buildings, including equipment should be declared free-released or dismantled. It would then be up to the owner, E.ON Kärnkraft Sverige AB (EKS) to decide what is to be done with the site in the future.

The signals from the Swedish Authorities during 1997, that Barsebäck NPP was pointed out to be the first NPP in Sweden to close down started up a long process for changing the organization and the future focus.

The strategy before closing down Barsebäck 1 and after that Barsebäck 2 was “Business as usual” and activities like five years employment guarantee before Barsebäck 1 was closed down and then changed to three years employment guarantee before Barsebäck 2 was closed was important to achieve a feeling of personnel confidence for the staff.

The Organisation at Barsebäck Kraft AB (BKAB) has gone down from 450 during operation of Barsebäck 1 and 2 to 50 employees (2009-01-01) involved in Service operation of both units. But still there are in total 250 persons placed at Barsebäck NPP with different kinds of job assignments.

To sum up with the resulting figure in the hand we can certify that BKAB:s management acting, in a dialog with trade unions, in face of the threat of the final shutdown of Barsebäck NPP in a highly safety way until and after the definitive closure. This acting has also created good conditions for the employees to be able to find a new occupation.

**INTRODUCTION**

Barsebäck NPP is owned by E.ON Kärnkraft Sverige AB (EKS), a subsidiary of E.ON Sverige AB. The nuclear power plant is located in southern Sweden on the west coast of Skåne.

## **Barsebäck 1 and 2**

Type	BWR (Boiling Water Reactor)
Capacity	1800 MWt, 615 MWe
Start of operation	1975 and 1977
Supplier	ASEA Atom
Owner	EKS
License holder	BKAB
Operator	BKAB
Production	Total 93,4 TWh net (1999)/ 108 TWh net (2005)
Status	Permanently shut down since 30 November 1999/ 31 May 2005
Operating status	Service operation (Care and maintenance) since 1 December 2006

Barsebäck 1 and 2 are two adjacent installations structurally linked via electrical buildings, control rooms and personnel buildings. A number of process systems are also integrated between the units. (*Picture 1*)



*Picture 1 Barsebäck NPP in Sweden*

## **HISTORY**

In 1997 the Swedish Parliament passed the law on the phasing-out of nuclear power. The law entitles the government to decide whether the right to operate a nuclear power plant should cease.

On 5 February 1998, the government decided, [on the basis of the law on the phasing-out of nuclear power], that Barsebäck 1 should close in June 1998. An appeal to the Supreme Administrative Court meant that the closure was temporarily postponed. After the Supreme Administrative Court declared that the government's decision should stand, Barsebäck 1 was closed permanently on 30 November 1999.

When the final political decision was taken that Barsebäck 1 would close down, the management of the company, together with the trade unions, set up projects called Framtidsfabriken/Nya Fabriken [The Future Factory/The New Factory] with the aim of carrying out a broad preliminary study of possible future scenarios and of describing these from the corporate and individual point of view. Around 50 employees participated in different working teams together with the management during this time.

In the first half-year **2000** BKAB gets a new organization, where operation and decommissioning are separated.

On 1 April **2002**, a new merged organization was formed, consisting of the two companies Ringhals AB and BKAB, which together made up the Ringhals group, a new organization with about 1500 employees. In spite of the merge the two companies will continue to operate as two separate legal entities.

During **2004** BKAB starts up all the activities, developed in a project called OBS. The activities concern how to take care of the staff and how to operate the plant safely.

On 16 December **2004**, the government decided, on the basis of the law on the phasing-out of nuclear power that Barsebäck 2 should close on **31 May 2005**.

On July **2005**, as a result of the closure of Barsebäck 2, BKAB was reorganized to adapt the organization to prevailing operating mode.

Barsebäck 1 and 2 have been in Service operation since **1 December 2006**, when all fuel has been transported away to interim storage, CLAB in Oskarshamn.

## **BKAB ORGANISATION DURING SERVICE OPERATION**

There was a re-organization at BKAB in 1 January 2007 to meet the needs for Service operation. For more details how the Company is organized please read the document "*Barsebäck NPP in Sweden – Decommissioning project*" (9350)

The Organisation at Barsebäck Kraft AB (BKAB) has gone down from 450 during operation of Barsebäck 1 and 2 to 50 employees involved in Service operation of both units.

When Barsebäck 2 was closed down 355 was employed at BKAB and the actual employee turn over at 1 January 2009 are as following:

- 50 involved in Service operation
- 36 belongs to BO - Replacement
- 2 on leave for new employment
- 4 on studies
- 1 employee in the former merged organization with Ringhals AB

Former employees have turned over to the following occupations:

- 75 have left Barsebäck for external employees
- 20 have started their own company
- 93 have retired by special agreement from the age of 60
- 36 are working fore Ringhals, local office at Barsebäck NPP
- 39 employed by Ringhals AB and working at their site.

But still there are in total about 250 persons placed at Barsebäck NPP with different kinds of job assignments, own staff and other companies.

## **SCENARIO FOR DECOMMISSIONING OF BARSEBÄCK 1 AND 2**

Decommissioning of Barsebäck NPP is according to the s.k. “Swedish system” (transportation and final storage of radioactive waste handled by SKB). This means that the ultimate storage for the short-lived low- and medium-active dismantling waste, SFR3, must be ready and in operation before dismantling begins. According to SKB:s plan the storage is in operation 2020.

Barsebäck NPP will stay in Service operation until beginning of 2018 when Dismantling operation begins with the aim of a free-realized site in the beginning of 2025. That means that the remaining buildings, including equipment should be declared free-released or dismantled. It would then be up to the owner, E.ON Kärnkraft Sverige AB (EKS) to decide what is to be done with the site in the future.

## **PERSONNEL DEVELOPMENT AND STAFF REDUCTION**

The signals from the Swedish Authorities during 1997, that Barsebäck NPP was pointed out to be the first NPP in Sweden to close down according to political reasons, started up a long process for changing the organization in the future.

The strategy before closing unit 1, 30th November 1999, was “Business as Usual”:

- We are not the one to close unit 1
- Continue operation and maintenance of Unit 1 & 2
- Further modernization, development and investments
- Continue recruitment of new staff
- Awareness and participation through communication

And when it was time for unit 2, 31st May 2005:

- We are not the one to close unit 2
- Focus and priority of Unit 2 – operation, safety, maintenance, competence
- Increasing the co-operation with Ringhals NPP
- Create good working atmosphere, awareness, motivation and belief in future
- Keep high safety culture
- Develop knowledge about decommissioning
- Follow the Swedish energy politics and analyze the consequences regarding unit 2

Following activities was important to achieve a feeling of personnel security:

- The employees at Barsebäck got a five years employment guarantee before B1 was closed and it was changed to a three years employment guarantee before B2 was closed, which gave the staff confidence and security
- The Compass – individual supportive discussions
- Seminars for managers to face the future
- HR-department gives general support
- Establishment of an internal support group
- Special crisis units (friends, healthcare and church)

During the years from 1997 there have been a lot of sk. projects where the staff has been fully involved:

- The Future Factory (1997) – this project analyzed the possibilities fore the company and staff before the closure of Unit 1. What will happen and what can we do.
- The New Factory (Dec 1999) – this project established to prepare, plan and start activities as a result of the closure of unit 1
- The OBS project – this project was started to handle the political threat on unit 2 during 2002-2005.

- The Factory 2006 – this projects goal was to co-ordinate and secure all activities that have to be done before Service operation.

The closure of Barsebäck 1 and the uncertainty concerning the whole of BKAB:s future has weighed heavily on many of the employees. Questions have been aired and discussed but the decisive and most important item on the agenda has been to maintain employees' motivation and professionalism in their work.

By making relatively quick decisions, before the definitive closure of Barsebäck 1, company management together with the trade union organizations attempted to predict the problems that could arise and to deal with them were realistic.

One way was to change the organizational structure according to the current plant status, provide security for employees through employment guarantees and thus increased potential for securing human resources. Establishing a mentoring system with regard to skills and experience feedback. A design school was established where some of the employees have had the opportunity to be retrained for other duties. Widen the individual's choice of other duties.

Further means are, for example, to priorities proposals that are positive in terms of the company and employees. This engenders creativity in the individual.

The results of the above examples of measures when faced with a sudden closure of a nuclear power station result in the following:

- Good dialogue between the authorities that have expressed a positive attitude to Barsebäck 1's decommissioning work.
- An openness and positive dialogue with staff.
- The individual could sense greater security and choice when faced with the future.

Following the political decision about the final shutdown of Barsebäck 2 the management of BKAB in consultation with the trade unions have concluded a contract about the rules in the process of conversion for the employees into alternative occupation.

As agreed there is a three year employment guarantee which began 31 May 2005 when Barsebäck 2 permanently shutdown.

Each employee had the responsibility to analyze his situation write down his individual development plan with the following possibly ways:

- Continuous work at Barsebäck NPP.
- Another work at Ringhals AB, Vattenfall AB, E.ON Sweden or another company on the external market.
- Competence progress for another work.
- Retirement at the age of sixty during employment guarantee.
- Start their own company

## **WHAT DID WE ACHIEVE DURING THE TRANSITION, 1997-2008?**

### **Proactive Management ideas and performance**

- Five years employment guarantee as one pillar, later changed to three years
- Long term strategy for creating social security – supportive to our staff
- Activities and actions introduced in due time – not too early!
- Business as usual – operation, maintenance and investment for unit 1 and 2
- A high degree of involvement of staff in future development
- Information is crucial – open, reliable and fast

- Maintaining a strong safety culture
- As Simple as possible, but not more simple than that
- Analysis – mood/motivation, tracking safety, personnel leaving and absence due to illness
- Benefit from the co-operation with Ringhals
- Gather knowledge of decommissioning
- Simple, safe and optimized care and maintenance
- Plan in advance different future scenarios to meet possible changes
- Identify key resources and secure the company with competences

### **Result**

Closure of the plant with professionalism and dignity  
 Safety and production on top – all time high 2004

### **Staff reduction leads to new possibilities and challenges for the employees**

- Reducing staff from 450 during operation to 40 during Service operation (care and maintenance)
- Create conditions for each employee to see future opportunities
- Internal and external support groups and a special crisis unit
- Individual development plans
- Own personal replacing external resources in several areas
- Different possibilities: Continued employment at Barsebäck, new employment in Ringhals or elsewhere, competence development for another area of work, starting your own business and early retirement.

### **Result**

Motivation and commitment

### **Interested parties – supportive stakeholders**

- Earn respect from stakeholders and build confidence
- Strong and supportive owners
- Open dialogue with authorities during their process of making new regulations
- Focus on decommissioning. Take the leading position
- Good relations to press and media
- PR-activities for the local community, for example: newspaper from Barsebäck NPP, a yearly calendar and different kind of events
- Hearing during the EIA (Environmental Impact Assessment)

### **Result**

Confidence and trust.

### **Critical success factors**

- Always open and reliable information – never hide away!
- Supportive to your staff – show solutions and express ideas
- Through influence and participation – create commitment, belief in future and social security
- Important to reduce uncertainty by information, communication and dialogue
- Support to the managers – both generally and individually
- Look out for mood changes
- Trustful co-operation with the labour unions
- As a leader – always visible and accessible.

To sum up with the resulting figure in the hand we can certify that BKAB: s management acting, in a dialog with trade unions, in face of the threat the final shutdown of Barsebäck NPP gave excellent condition of operating the NPP in a highly safety way until and after the definitive closure. This acting has also created good conditions for the employees to be able to find a new occupation.

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