

— ヘリコプターによる風車設置・スウェーデンの事例 —

一般にヘリコプターの能力やコストの面から、ヘリコプターによる風車運搬・設置は困難とされています。JWPA 発行の「風の道、電気の道、くるまの道」でも、ヘリコプターによる輸送は「輸送能力を超えることとなります。」としています。但し、非常に特殊な場合、例が無いわけではありません。

NEG ミーコン社のニューズレター「Powerful News」2002年9月号は、2002年6月、スウェーデンの Bydalen において、同社の NM48/750 風車をヘリにより運搬・設置を成功裡に行ったと報告しています。今回の事例はパイロットプロジェクトで、設置のためには、特殊な治具を作成し実地の試験（下の記事、右側2枚の写真）を行ったとの事です。



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**Innovation in the wilderness**

The Danish developer World Wide Wind's Swedish subsidiary, Bohus Energi, presented NEG Micon with a huge task: to erect an NM48/750 wind turbine with a 45-meter tower in the Swedish wilderness, using a helicopter. All components for the turbine were delivered by lorry to base camp, from where they were transported by helicopter to the site itself.

**Safety above all**  
 The turbine was erected in Bydalen in June 2002, and a high degree of innovation was required to carry out the task. On account of the safety zone around the helicopter, there could be no fit in the tower while the nacelle was being mounted. Instead, a so-called 'nacelle spear' was developed, with four fittings assembled, to fix the nacelle with the help of its own dead weight, thus making it possible to attach the nacelle from the helicopter. This solution was tested on an iron stand before it was carried out on site.

**New assembly method offers prospects**  
 During the project, it was also necessary to develop a new method for mounting the blades. Normally, they are assembled in the hub on the ground, but due to the very restricted area on the site, it was necessary to find an alternative solution. The blades were raised with a chain in a block and tackle and then mounted separately. This solution is a little more time consuming than the traditional method, but on the other hand it offers exciting future prospects.

"By mounting the blades in the air, we save space on the ground. This provides good prospects when you consider that blades are getting bigger and bigger. It may be possible to use this solution for projects in readily accessible sites as well," comments Jens Steen Nielsen of NEG Micon, who was project manager at Bydalen in Sweden.

**Respect for people and environment**  
 The actual background to the approach from Bohus Energi was that there is huge potential for erecting wind turbines in northern Sweden, but in areas where the environment and the people must be respected. The original population of northern Sweden, the Sami (Lapps), do not want an extended infrastructure, as this will increase the number of visitors. Therefore, air, rather than road transport, must be considered if turbines are to be erected in the areas concerned. This problem exists in many places in the world, where similar consideration is required.

"We are the first company to erect wind turbines using helicopters, and therefore we have also worked as inventors during the project to be able to carry it out successfully. Naturally, it is fascinating to be part of working out the whole installation process so that all the parts fall into place. It is a pilot project that has subsequently provided some very exciting prospects for installation in general. We have learnt a great deal which we can make use of in other projects - both in areas that are difficult to get to and in projects with normal access by road transport," emphasises Nielsen.

NEG Micon was responsible for erection of a wind turbine in Bydalen, Sweden. It was a pilot project, in which the challenge was that helicopters had to be used for installation at the site, which is situated in the wilderness.

Filters could not be present in the tower during mounting of the nacelle, and therefore the 'nacelle spear' was developed. The picture shows a test before final assembly.

**Gear retrofit near conclusion**

Over 1000 of the approximately 1250 gearboxes affected by problems with the bearings have been replaced in the Retrofit programme, and the huge operation has passed off largely as planned.

"Naturally we have continuously adjusted our plans in the light of the experiences we have had during the programme. However, this has not changed the fact that the central plan has been followed to the letter. With the aid of our gearbox monitoring, we have optimised planning. This has meant that we have only experienced a few gearbox breakdowns during the programme, and that the turbines function properly after the replacement has been carried out. The Retrofit programme is still expected to be completed before the end of the year," maintains Jørgen Bonedfeld, customer service product support manager at NEG Micon.

He goes on to explain that the customers affected have been very satisfied with the handling of the programme, and the filters from NEG Micon have been well received out at the individual sites - most recently the American energy utilities EPL Energy and City expressed huge satisfaction with the handling of the replacements.

移転のお知らせ

NEG ミーコン社は11月1日に下記に移転しました。

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