Array loss model test, PN, 13/1-2006

Calculation results with the 4 models on Nysted off shore wind farm:

Model:	NO-old	NO-05	Larsen	Ainsley
Avg Park eff.	89,7	91,1	92,9	94,3
Relative		1,02	1,04	1,05

Conclusion:
With standard settings, offshore, the N.O.Jensen model calculate around 10% losses. Practice show so far (need more analyses) that the Array losses more likely are 17% - this can be obtained by increasing the roughness inside wind farm to class 1,5. With this "correction feature" the 4 different models are compared.

The 4 array loss calculation models reduce the Nysted wind farm with 72 WTGs from 5,7% (Ainsley) to 10,3% (NO-Jensen, old version). So the old N.O.Jensen model is the most conservative. If this need around 7% additional decrease, the Ainsley need at least 11% additional decrease - if conclusions on real array losses so far are correct. So until further parameter variation studies, it can NOT be recommended to use other than the old N.O. Jensen model for energy calculation - for turbulence calculation the other is a must.