

**Recommendation from State Supervision of Mines (SodM):  
'A lower yet stable production of gas'**

'Reduce gas production to a level at which seismic risk is minimised and stabilised as much as possible, while maintaining a steady rate of production.' This is the advice put forward by the State Supervision of Mines (SodM) in its recently published recommendation on the 'Seismic risk of the Groningen gas field'.

As Inspector General Harry van der Meijden explains, 'Production needs to be scaled back in a sensible manner. State Supervision believes it would be imprudent to reduce production to such an extent as to necessitate large and rapid fluctuations in production level during colder periods in order to meet the demand for gas. This could likely cause additional and, possibly stronger, earthquakes.'

State Supervision also recommends distributing the annual production in a risk-based manner over the various clusters in the Groningen gas field. This means that the distribution of production over the clusters would take into account developments in the number of earthquakes and the resulting seismic risk. In addition, consideration is given to evolving insights into the seismic threat (ground accelerations) and the increase in compaction (compression of gas-bearing rock). To do this successfully would require an adequate measurement and control cycle. A risk-based manner of production may have consequences for the existing production limits in the various areas of the Groningen gas field.

**Risk maps**

State Supervision advises basing the seismic threat and risk maps used for prioritising the reinforcement of buildings on a method of calculation that takes into account the composition of the shallow subsurface as well as changes in production. This is a method which has also been adopted by NAM, operator of the Groningen gas field.. State Supervision considers this method to be more appropriate for the specific earthquake problems in Groningen than the more statistical approach traditionally being used in relation to earthquakes.

**Risk to society**

Experts from the Meijdam committee (commissie Meijdam) have agreed with State Supervision on a method to determine and identify the social risk. This method can be used to determine the risk of larger groups of people becoming victims of an induced earthquake all at once. State supervision believes this analysis should be carried out as soon as possible, as previously urged in earlier recommendations, referring to the concept of 'group risk'.

In preparing this recommendation, State Supervision drew on information from independent analyses carried out by TNO, TU Delft, and CBS. In addition, it also consulted earthquake experts from abroad.