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Fracking and earthquakes: why regulations must not be weakened

The fracking industry is demanding that the government weakens earthquake regulations. The regulations, designed to protect local people and the environment, are an important safeguard on an industry that last year caused 57 earthquakes while fracking a single well.

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Summary

- **Current context:** Fracking company Cuadrilla is demanding the government relaxes regulations, allowing for earthquakes 31 times larger and 177 times stronger than current limits before fracking is paused.
- **The risks from earthquakes:** Damage caused by fracking-induced earthquakes in 2011 resulted in the current regulation being introduced to protect communities and the environment local to fracking sites, and enable trust and confidence in the fledgling industry. Earthquakes caused by fracking risk damaging the drilling well, potentially releasing gas and pollutants into the local environment.
- **Moving the goalposts:** The current earthquake limits were introduced in 2012, and the industry did not raise an issue with them until the unsuccessful fracking attempt in 2018, which caused 57 earthquakes.
- **Public opinion:** The majority (54%) of the public believe earthquake limits should stay the same, with less than a quarter (24%) in favour of raising them.

Please write to the Prime Minister and Secretary of State for Business, Energy and Industrial Strategy and urge them not to weaken earthquake regulations for fracking.

Current regulation and context

Current fracking regulation for earthquakes is managed through the “traffic light system”, requiring fracking companies to halt operations for 18 hours if there is a seismic event of $0.5M_L$ (local magnitude) or greater – the “red light” threshold. This system was introduced in 2012 after earthquakes caused by fracking company Cuadrilla at Preese Hall in Lancashire resulted in the steel well casing being deformed¹.

In October 2018, Cuadrilla started fracking one well at Preston New Road in Lancashire – the first frack since the regulations were introduced in 2012. In the two months to 14 December, the British Geological Survey recorded 57 seismic events triggered by fracking. Five of these caused fracking to be stopped². The largest event was magnitude $1.5 M_L$ on 11 December.

Cuadrilla has asked for the regulations to be reviewed and called for the threshold to be raised to magnitude $2.0M_L$ ³. Seismic events are measured using a logarithmic scale, so raising the limit from $0.5M_L$ to $2.0M_L$ would allow earthquakes 31 times bigger, and 177 times stronger⁴, before action was taken.

The risks from earthquakes caused by fracking

After the well casing was deformed at Preese Hall, the traffic light system was introduced to ensure that local residents and the local environment were not put at undue risk from fracking-induced earthquakes.

Despite the fracking industry dismissing the risks from smaller earthquakes at surface level, the most significant risks are from impacts underground. Professor Stuart Haszeldine of Edinburgh University has said:

“The practical significance is not whether these tremors are felt at the surface or not, but in the potential to damage the borehole, and the potential to create gas pathways from the shale towards larger faults, towards shallower aquifers, and to the surface”⁵.

Not only can smaller earthquakes cause problems underground in themselves, academics from Stanford University studying seismic activity and fracking in the US have found that tiny tremors caused by fracking could be early signs of conditions underground that could destabilise faults and trigger larger earthquakes. The study’s lead author Professor William Ellsworth commented:

“These small earthquakes may act like canaries in a coalmine. When they happen, they should be viewed as cautionary indicators of underground conditions that could lead to larger earthquakes”⁶.

Moving the goalposts

Cuadrilla has called for the “red light” threshold to be raised to 2.0M_L. But in 2012 experts for the government rejected a threshold of 1.7 M_L, saying that it was “*undesirably high from the viewpoint of prudent conduct of future operations*”⁷.

Cuadrilla and the fracking industry accepted the 0.5M_L threshold when designed, and only asked for the limits to be raised after it had problems. Energy Minister Claire Perry wrote to Cuadrilla in November stating “*I note that your Hydraulic Fracture Plan was developed and reviewed over several months with reference to existing regulations, including the traffic light system and at no point did you communicate that it would not be possible to proceed without a change in regulations*”⁸.

Conservative MP Mark Menzies, whose Fylde constituency includes Cuadrilla’s Preston New Road site, said in a Parliamentary debate in October:

*“For six years the industry was not approaching me, or not approaching anyone, to say that this threshold was far too low. We now have calls to say that actually it needs to be a 1.5 or it needs to be a 2 in order to trigger a red event. I’m sorry but that ship has sailed. You had six years in order to make the case for that and no case was made”*⁹.

The experts who set the limit described it as a “*prudent threshold value*”¹⁰ and the then Energy Secretary Sir Ed Davey MP, introducing the regulations, wrote “*I stress that we will be moving forward with appropriate caution*”¹¹. In November last year, Sir Ed Davey tabled a Parliamentary Early Day Motion saying that the current limits should not be raised¹².

Although the experts added that the limit “*can be adjusted over time, if appropriate in the light of developing experience*”, Professor Peter Styles, a former government advisor who recommended the traffic light system, said “*It’s not the time to raise it [the threshold]. Let’s carry it out under these rules, observe it, and then revisit it when we have the data*”¹³. It would be irresponsible to weaken regulation for an entire future industry based on the experience of a single well in a single part of the country which caused 57 earthquakes.

Public opinion

Recent polling by the Campaign to Protect Rural England has revealed that less than a quarter of people (24%) would support weakening limits on earthquakes caused by fracking. More than twice as many people (54%) support the rules as they stand¹⁴.

The government's own survey reveals that only 13% of people support fracking, while 35% oppose it, with 40% of those opposing citing risk of earthquakes as a reason¹⁵.

What has the government said?

Energy Minister Claire Perry initially raised the possibility of changing the limit¹⁶, but has since said “*These regulations have been working as intended and there are no plans to review the traffic light system*”¹⁷. Claire Perry has also been reported as saying that “*it would be a very foolish politician who would do things that would be considered to be relaxing regulatory standards when we are trying to reassure people about safety*”¹⁸.

However, Ms Perry has also said that a review “*is a scientist-led decision—it is nothing to do with politicians*”¹⁹. This is passing the buck: whether or not to have a review is a decision for the politicians who have been promoting and supporting the industry, while at the same time saying that stringent regulations were in place.

Conclusions

The government must not give in to the demands of the industry and review or weaken fracking earthquake regulations. Regulations were put in place to protect people and the environment, following damage caused by earthquakes in 2011. The industry accepted the regulations right up to the point when it discovered that it could not work within them. Moving the goalposts at this stage would further weaken confidence in regulations and make people think that the government puts the interests of fracking companies before those of local communities.

References

Notes

1. [1] 'DECC 2012, Preese Hall shale gas fracturing: review & recommendations for induced seismic mitigation'
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/15745/5075-preese-hall-shale-gas-fracturing-review.pdf
2. See <https://drillordrop.com/2018/10/27/cuadrilla-tremor-tracker/>
3. Financial Times, 31 October 2018, 'Cuadrilla says UK fracking rules risk strangling it'
<https://www.ft.com/content/cb36ad4e-dc5e-11e8-9f04-38d397e6661c>
4. For an explanation of the difference between earthquake magnitude/size and strength/intensity, see
<http://www.earthquakes.bgs.ac.uk/education/faqs/faq17.html>
5. Science Media Centre, 24 October 2018, 'Expert reactions to Lancashire earth tremors'
<http://www.sciencemediacentre.org/expert-reaction-to-the-lancashire-earth-tremors/>
6. Stanford University, December 12 2017, 'Small earthquakes at fracking sites may be early indicators of bigger tremors to come, say Stanford scientists'
<https://news.stanford.edu/2017/12/12/small-earthquakes-fracking-sites-may-indicate-bigger-tremors-come/>
7. DECC 2012, Preese Hall shale gas fracturing: review & recommendations for induced seismic mitigation op cit
8. Unearthed, 13 January 2019, 'Minister rejects fracking firm's call to weaken earthquake rules'
<https://unearthed.greenpeace.org/2019/01/13/claire-perry-cuadrilla-fracking-earthquake-regulations/>
9. House of Commons 31 October 2018, Westminster Hall debate on Shale Gas Development,
<https://hansard.parliament.uk/Commons/2018-10-31/debates/A9925C7E-EB6C-4C0D-80C7-2B740C2E5FAE/ShaleGasDevelopment?highlight=six%20years%20industry%20not%20approaching#contribution-4898B361-7649-4AAC-9B24-032F2EC6080A>
10. *ibid*
11. DECC 13 December 2012 'Written Ministerial Statement by Edward Davey: exploration for shale gas'
<https://www.gov.uk/government/speeches/written-ministerial-statement-by-edward-davey-exploration-for-shale-gas>
12. See <https://edm.parliament.uk/early-day-motion/52311/fracking-regulations>
13. The Guardian, 1 November 2018, 'Minor earthquakes emerge as major threat to UK fracking'
<https://www.theguardian.com/environment/2018/nov/01/minor-earthquakes-emerge-uk-major-fracking-threat-lancashire>
14. <https://www.cpre.org.uk/media-centre/latest-news-releases/item/5065-just-13-of-people-believe-government-listening-to-them-over-fracking>
15. <https://drillordrop.com/2019/02/07/government-survey-earthquake-fears-push-up-opposition-to-fracking-support-drops-again/>

- 16.** Drill or Drop, 9 October 2018 'Fracking earthquake rules could be relaxed – energy minister'
<https://drillordrop.com/2018/10/09/fracking-earthquake-rules-could-be-relaxed-energy-minister/>
- 17.** <https://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2019-02-25/225406>
- 18.** See <https://twitter.com/emilygosden/status/1057577667631964160>
- 19.** <https://hansard.parliament.uk/Commons/2019-02-12/debates/A7C2DF3D-37F7-4EE2-831A-9E99C22E9D96/EnergyMarketDiversitySupply#contribution-D0218618-89C2-41F0-9624-7FD32047F61D>