CORE

Cumbrians Opposed to a Radioactive Environment

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NuGen's Stage 2 Proposed Scheme Consultation on the Moorside Project.

Cumbrians Opposed to a Radioactive Environment [CORE] submit the following comments to the Stage 2 Consultation. The comments are based on our reading of the consultation documents, written communications with NuGen's CEO and our attendance at the 'drop in' events held at Braystones and Broughton in Furness.

Formed in 1980, CORE makes the comments on behalf of its members and supporters.

CORE's opposition to nuclear power over the last three and a half decades is well documented and the proposed development at Moorside is specifically opposed on the grounds that it represents the wrong site for the wrong technology – a development that will stifle West Cumbria's renewables potential, rely on taxpayer subsidy, result in public health detriment and environmental contamination, produce nuclear wastes for which there is no final disposal facility, and attract the attention of terrorist organisations above and beyond that already recognised for the Sellafield site.

A central plank of CORE's campaign since 1980 has been to expose the risks to human health from the operation of nuclear facilities. Whilst the UK nuclear industry's complicity in the well-documented levels of ' radiation and health' detriment remains an unresolved and on-going topic of debate, a connection between nuclear power stations and levels of cancer in surrounding communities is documented in a sequence of reports in the UK and in Europe.

CORE believes that it is in the best interests of local communities, medical research and nuclear developers themselves to establish a 'base-line' health study prior to the commencement of construction of any new nuclear power station. It is disappointing therefore to find no evidence in the Stage 2 consultation that NuGen has given any thought or consideration to such a study or its commissioning from other agencies.

The greenfield Moorside site which has viably supported agriculture for centuries has neither geographic nor geological merit in terms of suitability for new-build. Rather, it owes its belated inclusion in the Government's list of 'suitable sites' solely to the pressure from a West Cumbrian pro-nuclear lobby fearful that, without new-build, the looming demise of Sellafied's commercial spent fuel reprocessing operations would spell the end of the industry's domination of the area and their own fixation on nuclear expansion.

Described by AMEC to a Nuclear Influencing Strategy Workshop in Kendal in 2008 as ***'difficult to construct a nuclear power station …. the depth to reach bedrock is so great that construction is unreasonable – it is not the most favourable site and currently has significant commercial disadvantages'***, the site is also geographically remote from where its electricity is needed, will necessitate the use of intrusive pylons inside and along the borders of the Lake District National Park and, because of its remoteness, suffer significant transmission loss 'down the line'.

In terms of development, the unsuitability of the site will be compounded by the plan to build three AP1000 reactors – a novel triple-build of the reactor type for Westinghouse – on a site considered in many quarters to be too small for such a development – being confined to the west by the Irish Sea, to the east by the Sellafield complex and to the north and north east by local villages and the Lake District National Park.

Whilst the full construction, operation and production of electricity from the Westinghouse AP 1000 reactor has yet to be demonstrated anywhere in the world, NuGen's disingenuous public assertions that the AP1000 reactor is a tried and tested technology is clearly unsubstantiated. The reactor's true status is more accurately defined elsewhere in the consultation documents by NuGen as '***relying heavily on tried and tested technology'*** (emphasis added). A heavy reliance is no safe substitute for the tangible and documented track record that the AP1000 currently lacks, especially as the smaller AP600 on which its systems are based has itself never been built or operated commercially and therefore has no track record of its own.

In a nutshell, NuGen's proposed development at Moorside represents no more than the blatant exposure of West Cumbria and its communities to a triple-build of an untested reactor on an unsuitable site – a combination that augers badly for NuGen and, more importantly, for West Cumbrian communities.

Stage 2 Consultation Documents.

We found the documents to have been poorly collated and generally less reader-friendly than those provided for the Stage 1 consultation in 2015. We found that, rather than major elements of the Project being consigned to an individual document, the elements were published somewhat randomly over a range of documents. With a specific interest in the development of the power blocks, nuclear islands and reactor operations rather than the numerous 'associated developments', CORE found it unhelpful to find such information confusingly scattered sporadically among a range of documents.

Given that previous large scale nuclear developments in West Cumbria have coped well without the accommodation sites now proposed for Moorside, information on such sites was given undue prominence and would better have been consigned to an individual topic document. CORE found what it considered an 'overload' of accommodation data not only to be surplus to requirements but also to have been provided at the expense of what many will consider to be the significantly more important and permanent elements of the construction and operation of a new nuclear power station..

Project Timetable.

Over the last half decade – and even in the run up to the start of the Stage 2 consultation – NuGen and West Cumbria's compliant media were forecasting a construction start-date at Moorside of 2020, with the three projected AP1000 reactors completed and producing electricity by 2026. Given the evidence from the USA and China where AP1000 construction is taking 7 years or more per reactor – with no single reactor yet completed – and the numerous planning, preparation and infrastructure hurdles yet to be faced and surmounted by NuGen, that timetable for the development was clearly unlikely to be achieved.

That the Stage 2 consultation documents belatedly confirm a one–year delay to the deployment of the first reactor (now by 2025) exposes the myth of the original claim of a 4-year build time per reactor. At *Figure 1 – Moorside High-Level construction programme* the phased testing and 'start of operations' is shown as being scheduled towards the end of FY 2028. Assuming this refers to all three reactors, it represents a 2-year delay on the original claim of start-up by 2026. These latest projections themselves remain misleadingly – some would say disingenuously - optimistic and CORE can find no current evidence that refutes the warnings it issued in its 2015 assessment *Moorside Build-Time and Job Projections - All Spin and No Substance*[i] that the completion of all three reactors was unlikely before 2030 at the earliest.

CORE believes the criticism levelled at the extended delay to AP1000 construction in China – that '*Westinghouse oversold the system, oversold the technology and promised more than they could really deliver'* more than aptly describes NuGen's current 'head in the sand' stance on Moorside's timetable as portrayed in its Stage 2 consultation documents. For, based on little more than a Westinghouse sales pitch now overtaken by events, the 4-year build time per reactor claimed by NuGen is outdated and clearly 'dead in the water'.

Underlying this stance is NuGen's naive underestimation of a number of factors that have the potential to delay both pre-construction and construction activities. Such factors include getting the AP1000 reactor through the Regulators' Generic Design Assessment (GDA), obtaining all necessary planning and licence approvals and a finalised grid transmission connection and securing approval from the Secretaries of State for the Development Consent Order (DCO) in time to make an investment decision in 2018. Similarly underestimated is the prospect of bringing to fruition – in less than 2 years from DCO approval - all the major infrastructure improvements needed in West Cumbria to allow construction to start at Moorside by 2020 or shortly after.

The Jobs 'Bonanza'.

Whilst the development of Moorside will involve a substantial workforce, the number of genuinely new jobs created is likely to be a disappointment to the region's unemployed.
In reality, such jobs need to be viewed against a number of factors. These include the intended provision by Toshiba and Westinghouse of their own skilled crews, overseas craftsmen, UK's itinerant construction workforce and the several thousand Sellafield workers who will be seeking further employment when the two Sellafield reprocessing plant and associated facilities close down in 2020 or soon after. If construction work is therefore likely to offer relatively thin pickings to locals, the pickings for those currently unemployed are going to be significantly thinner in terms of operational jobs for the new reactors, many of which will be taken up by those transferring from Sellafield.

CORE notes that, whatever the level of employment created by the Moorside project, it will compare unfavourably with the job creation figures anticipated to be secured by the full development of Cumbria's renewable energy potential as documented in former chief scientist Sir Martin Holdgate's 2010 assessment of a range of energy sources within the county.

Inadequate detail, information or forethought..

Despite NuGen's Stage 1 assurance that more detailed information on a range of topics would be 'worked up' and presented in the Stage 2 consultation documents, such additional detail has not in fact been provided in many cases. Of particular note, we refer to Moorside's **Circulating Water System** and the plans to improve **the wider West Cumbrian transport infrastructure.** The fact that neither major issue has been given due prominence in the Stage 2 consultation infers strongly that NuGen's case for developing Moorside is not yet sufficiently advanced for scrutiny in a public consultation that effectively presents the final opportunity for stakeholders to have their say.

Circulating Water System (CWS)
Given that the CWS is a critical component of reactor operation, the lack of detail on the system's offshore elements – the intake and outfall facilities, the sub sea-bed tunnels and their interconnection with the proposed forebay facility – is considered by CORE to be a major omission. Whilst it is recognised that the precise location of the sub sea-bed tunnels cannot be determined until the completion of the current offshore survey and its Phase 1 and Phase 2 programme of boreholes, it beggars belief that at this stage of the development Nugen has not worked up the CWS details to a degree that would have included fish and debris screening options for the sea intake facilities and plans for servicing the cooling tunnels. Further, that it has been unable or unwilling to provide sufficient data of suitable quantity or quality to enable consultees to properly and reasonably 'have their say' on the scale and practicalities of the combined offshore facilities which are so critical to reactor operation and represent an element of development that has major implications for West Cumbria's marine environment.

When viewed from the perspective of the catalogue of inconsequential information provided by NuGen - the Corkickle accommodation block providing 50 parking spaces for bicycles, the fence surrounding the changing rooms at the Mirehouse football pitch would be 5 feet high, the proposed new rail loop at St Bees would be 1.8 metres to the east of the existing track and the Corkickle rail platform for workers would be exactly 1.1 metres high, it is patently absurd that more detail of the CWS could not have been made available for consultation.

Whether or not through negligent advance planning by NuGen, it is highly regrettable that the current offshore survey, approved by the Marne Management Organisation (MMO) only in late April just days before the start of the Stage 2 consultation, was not carried out in time that would have allowed the data acquired from the survey (to determine the more precise location of the cooling tunnels and inlet/outfall facilities) to be included in the consultation documents. In the event, a map identifying the location of the offshore survey's eleven Phase 1 boreholes that was available via the MMO's licence approval document gave at least some indication of a range of possible cooling tunnel locations and orientation. The map but was not made readily available as consultation material.

In a response to CORE's written demand for an extension to the consultation period to allow the Phase 1 and 2 CWS findings to be available for consultation, NuGen's CEO stated that ***'if we were to present at Stage 2 firmed up detail, then consultees would not be able to influence the proposals. NuGen is keen that the Moorside Project is developed with input from stakeholders, the local community and others'.*** This view clearly begs the question as to how stakeholders can possibly make such input if NuGen singularly fails to provide the necessary information

A specific example of NuGen's failure to provide all available information on the CWS was the likely size of the cooling water tunnels. Such information, obtained by CORE during the Stage 1 consultation in 2015 – as ranging between 6-8 metres - was not provided in the 2015 consultation documents and was again omitted from the Stage 2 documents despite again being confirmed to CORE at the 2016 drop-in sessions. Had this information, and the further details of the cooling inlet and outfall facilities provided by a Westinghouse representative, appeared in the consultation documents, consultees would have been afforded a significantly better grasp of the scale and design of the proposed marine facilities. Such information would, for example, have enabled calculations to have been made on the volume of excavation spoil likely to result from tunnelling operations (estimated by CORE at 804,800 cubic metres for 4x4km tunnels of 8m diameter) and allowed questions to be raised on the disposition of the spoil and whether or not it had been included in NuGen's total spoil estimate for the development.

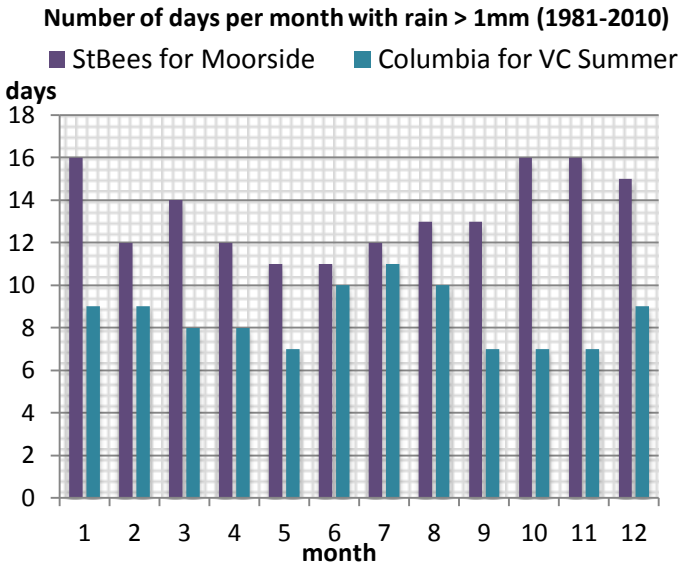
It has to be assumed that NuGen's Development Consent Order (DCO) application in 2017 must provide significantly more data on the CWS within its Environmental Statement than that supplied for public consultation which consists solely of the intended use of two intake and two outfall facilities and their respective tunnels ranging up to 4 kilometres in length and excavated in limited outline - by several tunnelling methodologies within NuGen's 2000 hectare 'Indicative Area for Marine Infrastructure'. On the basis that the DCO will be more informative on the CWS plans, Stage 2 consultees will feel rightly that they have been disenfranchised on this issue.

It is also noted that whilst the Stage 1 consultation documents made reference to '***an option for the provision of auxiliary cooling towers is also under consideration. These may be needed to augment the use of cooling water being drawn from the sea',*** there is no mention in the Stage 2 documents of the option either being further pursued or permanently abandoned. Given that cooling water is indeed going to be drawn from the sea, an update on the option would have been useful to consultees in the event that the offshore survey might belatedly reveal the need for auxiliary cooling facilities whose location would dynamically alter the Moorsside site layout as currently portrayed.

Climatology.

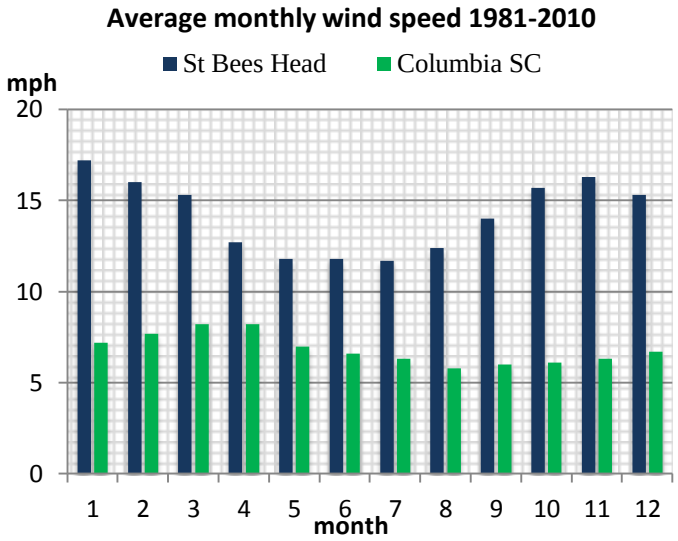
Further, whilst paying lip-service to the climatology aspects of West Cumbria, NuGen appears not to have factored into its timetable either the adverse impacts of West Cumbrian weather patterns and events or their effect on a coastline exposed to the most extreme Atlantic weather conditions

From a meteorological perspective, the greatest risk of construction delay to the development of a project the size of Moorside project is posed by a) wet weather and b) wind strength – or a combination of both. A comparison by CORE of meteorological records in West Cumbria (Met Office record at neighbouring St Bees Head 1981-2010) with those at the VC Summer AP1000 site in South Carolina (US Climate Data at VC Summers neighbouring city of Columbia 1981-2010) shows major differences in both weather elements (and others such as temperature and hours of sunshine) that strongly favour the US site. The records reveal that the Moorside site can expect conditions with significantly greater potential to delay construction than those at the unfinished US VC Summer AP1000 site which itself has been subjected to construction outages due to periods of adverse weather. The inter-site comparison is shown graphically below.



The record shows that the Moorside site is likely to suffer at least 50% more 'rain days' (161:102) with the potential to turn major excavation areas into an unworkable quagmire. It also has the potential to damage the moisture sensitive steelwork and other materials that will be exposed to salt air and coastal corrosion for extended periods

Average wind speeds local to Moorside are recorded as being more than double those in the US (171:82). They will limit crane use, especially the Heavy Lift Derricks (HLD) used for AP1000 build in the US. With the height and reach of 500+ feet for raising modules of over 1000 tonnes, the greatest threat to HLD's is posed by wind, rain, snow and lightning .



Moorside is similarly disadvantaged by fewer sunshine hours and lower temperatures, thus prolonging the drying out processes of a wet site. For example, the annual average maximum temperature at VC Summer (1981-2010) is 24.0 degrees C, whilst St Bees averages 11.6 degrees C. Whilst there will be some small local variations between Moorside's weather patterns and those at St Bees Head, the latter is deemed sufficiently representative of the likely conditions to be faced by the development and has been used by NuGen itself in the Stage 1 consultation documents.

In summary, the failure of the pre-construction and construction timetable to adequately take into account not only weather conditions, the other issues outlined above and those 'outside the developer's control' that pose major delay risk suggests a less than thoughtful forward planning approach and ethic by Nugen. This raises major doubts about the robustness and veracity of the entire project as portrayed by the Stage 2 consultation.

The wider West Cumbrian transport infrastructure

Road.
Other than the road improvements relating directly to the Accommodation sites, and the suggested alternative entry routes to serve both the Sellafield and Moorside sites, CORE could find nothing in the consultation documents to suggest that West Cumbria's currently substandard road system – a hurdle that has bedevilled local communities for decades and a major stumbling block for the proposed development in terms of the delivery of reactor modules and construction materials to Moorside – has been adequately addressed. Indeed, NuGen appears to have done little more than tinker with the edges of the age-old problem.

The plans for new service roads for the proposed accommodation sites, the alterations to some roundabouts and the freeing-up of parking space in local towns does nothing to relieve the number of pinch points on West Cumbria's main road arteries and their susceptibility to grid-lock in adverse weather and vehicle breakdown accident scenarios - particularly those to the south of the development which have not featured at all in NuGen's plans despite a history of chronic congestion in everyday use. More importantly, a major nuclear development such as Moorside should have prompted specific action by the developer to ensure that major evacuation routes in the event of nuclear accident with offsite consequences were brought up to standard. It is concerning to find no evidence that such action, either direct or indirect through other agencies, has yet been contemplated or initiated by NuGen.

Rail.
The limited improvements proposed for the equally substandard rail infrastructure comprise new worker stations/platforms, an internal railway system within the Moorside site, and a new St Bees loop. These and the proposed work at Workington docks appear unlikely to mitigate against the congestion and disruption to passenger and non-nuclear freight services caused by the major increase in rail traffic expected from Moorside's construction and operation.

The single track section of the coastal railway remains unresolved. Whilst the new loop at St Bees offers some relief to administering the flow rail traffic, CORE notes that the planned extension of the existing loop southwards runs contrary to the findings of a Cumbria County Council study in 2010. This Cumbrian Coastal Railway Capacity Study concluded that any southern extension would be more expensive and *'present significant difficulty since it is likely that the existing cutting would have to be widened. The presence of housing on the Up side indicates that it would be necessary to widen the cutting on the Down side, with associated realignment of the existing single track ……'*

Marine.
Whilst the proposed MOLF and jetty system will allow deliveries to be made by sea, such systems are heavily tide and weather dependent and their use thereby restricted. NuGen's acknowledgement that regular dredging of the waters around the MOLF will be required to retain its operability fails to mention the protocols that must be established to cover the management, handling, treatment and offshore or onshore disposal of the dredged material. The seabed sediments will be radioactively contaminated from Sellafield's current and historic discharges, and the dredging operations themselves will clearly result in the re-suspension and wider dispersion of radioactivity. Whilst the overall dredging operations will be subject to MMO licence and scrutiny, it is of concern that NuGen has not identified the mitigation measures that will be required to minimise the impacts of such dredging.

CORE further notes what it considers to be an inconsistency in the timeline attributed by NuGen to the construction of the MOLF and its use in constructing the CWS for Moorside. Currently scheduled for the beginning of 2018, the work on constructing the Beach Landing and MOLF facilities could be put back by 1 year if TCPA approval is not secured and thereby delay completion of construction – with no unplanned stoppages – until the end of 2022 (as derived from the PEIR Figures 1 and 2.27 programme). Should such a delay be forced on the programme, the prospect of completing the major challenge of constructing the extensive CWS system in time to support the deployment of the first reactor by 2025 is unlikely to be achieved.

Summary of comments on Stage 2 Consultation

CORE found there to be a concerning lack of information – despite the promises made during the Stage 1 consultation - on some of the more major aspects of the developments. Despite the evidence available to NuGen, the project timetable remains as 'overcooked' as it was in 2015. By contrast, the amount of work still needed to be done to bring development progress up to what CORE believes to be full and final consultation status is 'undercooked'. There appears to have been little proactive action to initiate plans for the improvements to the area's wider road or rail infrastructure that are vital in enabling West Cumbria to cope with the stresses of major development that will last for well over a decade.

CORE is not overly impressed with the development progress and future plans as portrayed by the Stage 2 consultation, and remains highly doubtful of the robustness of a project that has little to commend it.

[1] http://corecumbria.co.uk/wp/wp-content/uploads/2016/02/Moorside-Build-and-Job-Projections-All-Spin-and-No-Substance.-January-2015.pdf

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