

National Grid SF₆ - A focus on decarbonising the electricity transmission network webinars

Please find below the answers to the questions asked during the SF₆ webinars on Thursday 19th September 2019.

Q1. You mentioned changing assets with non SF₆ systems, alternative gasses been one of these systems. Are you initially intending to replace just SF₆ where it acts as the insulation medium or SF₆ assets where the SF₆ acts as the insulation and interruption medium?

A1. The targeted replacement to meet our science based targets described in the webinar is limited in scope to 400kV outdoor gas insulated busbar which is the asset class exhibiting the worst leakage and which delivers clear value for consumers. In this application the role of the SF₆ is insulation only. Replacement of other assets, including switching devices such as circuit-breakers, is planned in accordance with our established asset condition based processes and where SF₆-free alternatives are commercially available we will look to utilise them. During T2 we expect this to be mainly possible for 132kV applications rather than 275kV or 400kV due to limited technology availability at the higher voltage levels.

Q2. Do we know enough about interruption gasses?

A2. The use of alternatives to SF₆ for arc interruption is certainly in its infancy and we will continue to learn more for many years to come in exactly the same way that we continued to learn about SF₆ over many years. Adoption of these new technologies by National Grid balances technical performance, cost and risk, taking into account our environmental ambitions and our desire to play our part in accelerating the global commercial availability of proven SF₆-free solutions. We are engaged globally in innovation programmes, knowledge sharing activities and Standardisation to ensure we are able to make fully informed decisions.

Q3. What percentage of your replacements in T2 will be SF₆ alternatives?

A3. Early replacement of leaking outdoor gas insulated busbar (GIB) described in the webinar would be 100% SF₆-free, either using conventional cable/busbar solutions or GIB with alternative gases. The optimum technology solution chosen will be site specific taking account of network requirements, technology availability, deliverability, and local constraints. For replacement of assets that have reached their end-of-life we expect only a small percentage to be replaced by SF₆-free designs in T2 due to the lack of commercial availability of suitable equipment; particularly at voltage levels exceeding 132kV. During T2 we will continue to work with suppliers and the wider industry to develop, prove and adopt SF₆-free solutions such that we reduce our reliance upon SF₆ as early as possible.

Q4. What is your policy on new build and putting new SF₆ onto the Network?

A4. At the highest level our Policy is to move away from SF₆ as soon as technically & commercially viable alternatives are available. Our present Policies are structured to minimise the mass of SF₆ installed by building AIS in favour of GIS and using mechanisms such as carbon assessment of projects. These Policies are being revised to recognise the developing availability of non-SF₆ solutions and to take due account of the much reduced environmental impact of SF₆-free equipment. The aim is to have a clear and structured Policy framework that drives us to adopt SF₆-free solutions as soon as they become technically and commercially viable whilst remaining “technology-agnostic” and operating within the relevant procurement and commercial frameworks to which we are subject.

Q5. Can you specify in more detail again the 2023 installations according to Option 2.

A5. NGET have understood the performance of our existing asset base, and have identified 2 families of Gas Insulated Busbar (GIB) that have a much greater leak rate than general equipment. There are alternative technologies that could be utilised in this case – ‘Clean’ GIB or HV cable (design dependant) and the request for funding is to remove these assets only (not the CB/Disconnectors/IT/Earths etc) and replace with alternative technologies. The 2023 date input into the model is an expected average date that is used for forecasting, actual dates will range from 2021-2026, dependant on contracts etc.

Q6. Based on what criteria would NGC choose the specific SF6 alternatives?

A6. All solutions are required to meet the minimum safety, technical and performance requirements of the transmission system and comply with all relevant legislation. Beyond this we are “technology-agnostic” and select solutions using a total cost of ownership approach incorporating critical factors such as environmental impact and technology risk.