Summary of NPL Covid-19 Activities
May 2020

Along with ensuring the safety of our staff, NPL's priorities during the CoVid-19 pandemic have been to

- support UK and global efforts to respond to the direct issues caused by the virus
- identify the critical needs for businesses and organizations to resume their operations, including new working practises that minimise ongoing infection.

NPL is also continuing activities to improve the understanding of metrology in the general population and to support interest in STEM (Science, Technology, Engineering and Mathematics) at a time when many people are under "lockdown" conditions.

Immediate response to the medical emergency

Ventilator testing

NPL has successfully tested ventilators for three external organisations, with further testing in the pipeline https://www.npl.co.uk/press-media/production-and-supply-of-ventilators, alongside providing advice and equipment to organizations switching their manufacturing facilities to ventilator production.

In addition to this, we have three of our own ventilator designs for rapid and low-cost manufacture progressing well; including one which is a highly innovative and novel design. NPL is interested in partnering with healthcare providers and other NMIs with a requirement in their country for such ventilators.

Personal Protection Equipment (PPE)

NPL has supported a number of organizations with advice on appropriate testing and regulatory compliance for PPE. This has including a community initiative, Protecting Heroes, to design and manufacture a protective face shield compliant with standards EN 166, EN 168, EU 4016/425. NPL volunteers are also supporting the manufacture and distribution of the visor, using the NPL Sports Club facility.
www.npl.co.uk/press-media/npl-supports-in-production-of-ppe

Advice for performing ultrasound examinations

The International Society of Ultrasound for Obstetrics and Gynaecology (ISUOG), has prepared an opinion-based guidance document outlining rules for performing ultrasound examinations in pregnancy and for gynaecologic indications, recognising the challenges posed by the COVID-19 pandemic. Prominent experts and global members of the safety committee of ISUOG including Piero Miloro, Senior Research Scientist at the National Physical Laboratory (NPL), have contributed to the statement which will assist hundreds of thousands of healthcare practitioners around the world.

Biosensors

Our biometrology and quantum teams are working to develop a metrologically accurate diagnostic test for CoViD -19 based on a graphene platform, which will enable the validation of commercial tests.

Capabilities available

The NPL website (https://www.npl.co.uk/coronavirus) details capabilities that we have made available to support the response to CoVid-19, including:

- Sterilisation - Support for organisations investigating alternative forms of sterilisation, using existing expertise to evaluate effectiveness of different technologies
- Gas metrology - Help in the design and validation of novel oxygen generator and monitoring systems, using our expertise in gas measurement and sensor evaluation
- Diagnostic metrology - Support for developing coronavirus antibody tests, on assay development, device development, device qualification and bio-informatics

- Vaccine development - Validation of the structural, size and morphology properties of virus-like and virus-derived vaccine platforms, their distribution number and localisation in the cell and verification of the performance and efficacy of antigen-carrying vaccines

The UK Designated Institute (DI) LGC is also supporting the response to CoViD-19 through its metrology capabilities.
https://www.lgcgroup.com/newsroom-and-blog/news-and-blog/nml-role-in-covid-19/
This includes working with the National Institute for Biological Standards and Control (NIBSC) in the UK, NIM (China) and NIST (USA) to pilot a fast-track comparison on SARS-CoV-2 RNA measurement under the auspices of the Working Group on Nucleic Acid Analysis (NAWG) of CCQM.

Supporting organizations in resuming their operations

Our next phase focuses on supporting organizations in resuming their operations:

Temperature Services
We are supporting a number of manufacturers in the use of thermal imaging for fever screening. This has included support for one company with traceable ISO 17025 accredited temperature calibration, and guidance on confidence in thermal imaging measurement from our experience in healthcare applications and fever screening standards.

Quality system conformance
NPL has launched a consultancy-based service to assist organisations through the challenges associated with interruptions to the important tools which underpin their quality conformance, including access to scheduled calibration, reference materials and standards, or PT schemes

The current situation around the world is impacting the availability of standard tools used to provide traceability, demonstrate technical competence, and assure quality. As a result, ISO accredited laboratories, analytical service providers, and suppliers of reference materials and PT are assessing new approaches to their quality system conformance obligations, and where necessary finding ways to adapt their normal routines. The UK's national accreditation body, UKAS, has issued a Technical Policy Statement: *TPS 73 – UKAS Policy on Accreditation and Conformity Assessment During the COVID-19 Outbreak.* NPL's consultancy service will assist with ISO accreditation and support on the requirements outlined in UKAS TPS 73.

General Support
NPL is engaging with its industry and other stakeholders to identify other needs as organisations resume their operations after "lockdown"; launching a "Tell NPL" section on its website for organizations to bring forward their requirements. This will be supported by a social media campaign using the hashtag #TellNPL, inviting organisations to share their challenges with returning to operational activity post lockdown, and getting the message to UK industry that NPL is open for business, and is ready to listen. The web page will allow organisations to submit their issues, as a starting point for ongoing dialogue with NPL.

STEM Outreach

#MeasurementAtHome
With many people under "lockdown" conditions, we have launched a new, digital initiative, bringing a STEM related weekly measurement challenge to a wider audience, creating a measurement community that virtually brings science into households nationally and globally https://www.npl.co.uk/measurement-at-home.
Using the hashtag #measurementathome, we are inviting people to learn more about metrology and how it impacts our everyday life, by taking part in a series of challenges and submitting their results online. The first challenge was to "*break a flake"* – finding out the strength of breakfast cereals. The second challenge is to invent a unit:
https://www.npl.co.uk/measurement-at-home/invent-a-unit