Ofcom Annual Plan 2016-17:

Ofcom's main legal duties are to ensure that:

- the UK has a wide range of electronic communications services:

JRC highlights that the wide range of electronic communications services, indeed almost all products and services, that are offered to the UK's citizens and consumers relies directly or indirectly on the stable provision of electricity and / or gas (gas is used to generate typically 50%[1] of the UK's electricity) by the UK's Critical Infrastructure Utility Operations.

The stable supply of electricity relies increasingly on the systems that control the electricity grid. This includes resilient private wireless systems such as the 9.6 kbit/s in 12.5 kHz true[2] narrow band channels used for the UK-wide supervision and data control systems (SCADA).

-- Please note that whilst these systems may be included under the general heading of Machine to Machine (M2M), they are more appropriately referred to as Resilient M2M (RM2M). Thereby highlighting that typical public mobile based M2M solutions are unlikely to be suitable. (Especially by their base stations not having up to 96-hour power backup.)

-- Further, SCADA / RM2M systems operate to the remotest rural parts of the UK. This is far beyond the economic coverage areas of public mobile systems.

The current 2 x 1 MHz of 400MHz UHF Band spectrum that was allocated by Ofcom's predecessor in 1985 for critical infrastructure utility operations is just enough spectrum to control the existing SCADA grid systems.

-- It should be noted that the UK's Critical Infrastructure Utility Operations have more than 30 years' experience of designing, installing, operating, and maintaining their own resilient private machine to machine (RM2M) systems using proven long-term technologies rather than technologies, such as public mobile GSM, that have a limited lifetime. This experience puts them

The ever increasing roll-out of distributed generation, e.g. wind turbines, is putting an increasing strain on keeping the existing grid stable. The critical infrastructure utilities therefore need to move to Smart Grid systems.

The move to Smart Grids will require a significant increase in data rates, e.g. from 9.6 kbit/s to 64 / 100 kbit/s, and increased spectrum access. An increase to 2 x 3 MHz of 400 MHz Band private spectrum is predicted.

-- It should be noted that the average future private spectrum requirements for Critical Infrastructure Utility Operations Networks, including Smart Grids, is likely to be equivalent to only ~1.5 percent of the 1,200 MHz of spectrum identified for public mobile / IMT systems.

-- It is hoped that, when sought, this ~1.5% of alternative spectrum will not be seen as an excessive resource to keep the UK's lights on, the Sunday Dinners cooked, and next door's children quietly occupied.

[1] Source: Grid Carbon
[2] Narrow band: 6.25 / 12.5 / 25 kHz bandwidth channels. (Not to be confused with 200 kHz, so called, narrow band LTE public mobile systems.)

Implementing the Radio Equipment Directive:

JRC is pleased to see it confirmed that the Radio Equipment Directive (2014/53/EU) will be incorporated into UK Law.

-- It will be helpful if Ofcom can bring its milestone forward to 13 June 2017. This is in line with the EU's implementation date of this Directive.

EU Electronic Communications Framework:

JRC agrees with the principle of subsidiarity and ensuring Member States' competency.

-- In particular, Ofcom should continue to manage all international co-ordination requirements relating to the UK's radio systems rather than parts of this process being handed over to the EC.

Network security and resilience project:

JRC highlights that one the simplest security and resilience methods used to prevent cyber-attacks, etc, to the critical infrastructure electricity and gas grids is by their not being connected to any public networks. (Unfortunately, for this response, another security method is to not discuss their security details.)

JRC also highlights that, to meet resilience requirements, each remote location, even out in the most remote rural areas, is typically connected by two communication links. This is to meet the necessary system resilience requirements.

Additionally, the resilient wide-area voice systems that are used for emergency network repairs and day-to-day engineering communications also need to reach the remotest rural areas of the UK, and be equipped with up to 96-hour power backup.

JRC further highlights that the 23 GHz band is adversely affected by rain. The critical infrastructure utilities therefore prefer not to use these bands because the networks are typically under most physical stress during heavy rain / storms. This is when reliable communications with the remote infrastructure is most important.

Finally, with electricity sub-stations typically operating at between 11,000 volts and 400,000 volts, site security is major concern. It will therefore be helpful if 150 kHz wideband video systems and 1.25 MHz, etc, broadband systems could be made available within the 400 MHz Band for on-site security and other uses.

Spectrum assurance and enforcement:

JRC wishes to record its support and the continuing need for the Spectrum Technology, Engineering and Enforcement Teams which investigate interference and carry out activities to protect and manage the UK's spectrum. The work of these teams in reacting to interference to critical infrastructure communications and proactively preventing unauthorised use of spectrum is welcome and much needed.

Joint Radio Company (JRC)

JRC Ltd is a wholly owned joint venture between the UK electricity and gas industries specifically created to manage the radio spectrum allocations for these industries used to support operational, safety and emergency communications. JRC also represents gas and electricity interests to government on radio issues.

JRC manages blocks of VHF and UHF spectrum for Private Business Radio applications, telemetry & tele-control services and network operations. JRC created and manages a national cellular plan for co-ordinating frequency assignments for a number of large radio networks in the UK.

JRC also manages a significant number of 1.4 GHz links and is keen for their protection and the on-going access to this band.

The VHF and UHF frequency allocations managed by JRC support telecommunications networks to keep the electricity and gas industries in touch with their network assets and field engineers throughout the country. The networks provide comprehensive geographical coverage to support the operation, installation, maintenance and repair of plant in all weather conditions on a 24 hour / 365 days per year basis.

JRC's Scanning Telemetry Service is used by radio-based System Control and Data Acquisition (SCADA) networks, which control and monitor safety critical gas and electricity industry plant and equipment throughout the country. These networks provide resilient and reliable communications at all times to unmanned sites and plant in remote locations to maintain the integrity of the UK's energy generation, transmission and distribution.

JRC works with the Energy Networks Association's Future Energy Networks Groups assessing the ICT implications of Smart Networks, Smart Grids, and Smart Meters.