

Continuous RF Compliance Monitoring and Sustainability

Authored by: Thomas W. Ferguson, CEO
Waterford Consultants LLC
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Waterford Consultants LLC, the leading regulatory compliance services firm in the US since 2004, worked with industry leaders including FCC licensees to develop a solution which delivers continuous monitoring of the RF environment and FCC compliance status at a wireless site. The only technology of its kind to be designed and manufactured in the US, in 2018 the Radio Frequency Infrastructure Sentry (RFIS™) achieved numerous patents in the US, United Kingdom, and Europe due to its unique ability to perform continuous, remote, precision-based monitoring of antenna installations to support ‘real-time’ FCC RF hazard compliance.

Sustainable organizations strive to balance the triple bottom line of *people*, *planet*, and *profit* to achieve long-term success and viability. This means that organizations cannot be sustainable without protecting the safety, health, and welfare of their most vital resource: workers.

The four pillars of sustainability

- 1) Environmental
- 2) Human
- 3) Social
- 4) Economic

Environmental Sustainability

- Avoidance of the depletion of natural resources in order to maintain an ecological balance ... "the pursuit of global environmental sustainability"
- The United Nations (UN) defines sustainability simply as “meeting the needs of the present without compromising the ability of future generations to meet their own needs.”

Deployment of the RFIS™ system on any wireless site dramatically decreases the need for traditional wireless operator, tower-co, asset management, and RF/EME vendor firms to conduct routine RF safety and compliance audits, as well as periodically inspect the condition of applicable engineered compliance controls (e.g., RF alert signage, barriers, etc.).



1. <https://calculator.carbonfootprint.com/calculator.aspx?tab=4>

2. Global Challenges, Issue no. 9, March 2021; <https://globalchallenges.ch/issue/9/the-rise-of-inequality-and-its-contested-meanings/>

The elimination of these “truck rolls” to the site that would otherwise be traditionally required represents a significant and positive contribution toward the reduction of vehicle-generated carbon emissions.

- For example, a 2019 Toyota Tacoma driving a total of only 1000 miles every month to wireless sites results in a total annual carbon footprint of 5.02 metric tons of CO₂.¹

Human Sustainability

- Human sustainability aims to maintain and improve the human capital in society. Investments in the health and education systems, access to services, nutrition, knowledge and skills are all programs under the umbrella of human sustainability.

RF awareness, health and safety training is an integral part of every commercial enterprise related RFIS™ deployment where wireless transmission equipment is present.

While many companies may have an established EH&S (Employee Health and Safety) Program, and despite the FCC/OSHA’s May 2021 mandate that workers in areas where the FCC’s maximum permissible General Population RF exposure limit is exceeded be formally trained in the area of RF safety, it’s been Waterford’s experience that nearly all of the commercial and enterprise clients we’ve questioned (where wireless transmission sites exist) do NOT have RF emissions exposure and/or RF safety related subject matter included in their formal program documentation. An investment by any business owner in the occupational RF health, safety and preparedness will play a critical and positive role in the enhanced education, knowledge and health of its employees, vendors and subcontractors.

- In 2022, RFIS™ was deployed on the rooftop of a high-rise building in Milan, Italy. The building owner reported that the presence of a cellular tower roughly 6 blocks away (but highly visible from the upper floors’ and rooftop) was raising concern with existing residents, while prospective property buyers (who ultimately did NOT buy) repeatedly inquired about the [perceived] health effects of the “cell tower down the street”, asking if any of the residents had reported any illness, injury or other health related symptoms.



By deploying the RFIS™ system and demonstrating the ability to monitor compliance with the government’s RF exposure limits, the building owner is now able to present to the residents of the building, as well as perspective buyers, a proactive, technology-driven, unbiased solution which demonstrates awareness and overall commitment to human health and safety.

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Social Sustainability

- Social sustainability is about identifying and managing business impacts, both positive and negative, on people. The quality of a company's relationships and engagement with its stakeholders is critical.
- Contributing in other ways to improve the lives of the people we affect, such as by creating decent jobs, goods and services that help meet basic needs, and more inclusive value chains.
- Make strategic social investments and promote public policies that support social sustainability.

With the *traditional* RF compliance audit process followed in the US and many countries abroad, a given site is visited at most once every 1, 2 or 3 years by a single Waterford field technician for the purpose of obtaining RF readings with specialized equipment.

The RF data obtained is then evaluated by a Waterford engineer and a formal report is generated, then delivered to the client who is most often the wireless operator. At the operator's discretion, the report may then be shared with the property owner, landlord, jurisdictional authority, etc.



Little is done, however, to impart the knowledge and/or protective benefits this report offers to other contractors relevant to the property or the community at large. Since the compliance guidelines were implemented in the '80s, the entire audit and compliance process has been approached and treated by many in the wireless industry as a "check box exercise", albeit a mandatory one – and for some, a nuisance to be (irresponsibly) avoided when possible.

Alternatively, deployment of the RFIS™ system on or near a wireless site not only addresses the problem of characterizing (or even approaching) regulatory compliance as a mundane necessity, but it serves Waterford, the wireless operator, the property owner, landlord, other property-related vendors and contractors, jurisdictional authority, and the community at large in a variety of long term and positively impactful ways.

- The property/venue owner and building occupants are safely protected against any potential for RF hazards (i.e., elevated RF exposure) that would otherwise go unknown, as the property/venue owner is alerted immediately upon the discovery of any increase or change in compliant RF levels – both on an individual and cumulative basis.
- Since the advent of the internet, particularly in recent years there has been significant misinformation published regarding the dangers – be they *perceived* or *real* – associated with the health effects from RF exposure at or near wireless transmission equipment. This is largely due to an ongoing absence of data *transparency* by the wireless industry on behalf of the general public. The data generated by RFIS™ is meant to provide accurate and reliable clarity, as well as transparency where RF activity exists and is potentially a concern. While there is no legislation currently which mandates the RFIS™ data be shared

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publicly, the manner in which the data is formatted makes it conducive for easily doing so and more and more RFIS™ clients are electing to share the RFIS™ data with interested parties. This is a huge step forward in bridging the *chasms of distrust* that seem to exist between the public, commercial, scientific and political communities. RFIS™ is creating open dialogue which has never occurred before – aiding in the growth and development of socially responsible communities.

- RFIS™ deployment creates jobs. Engineering, installation, and monitoring of the site(s) all require dedicated employment by a larger quantity of [Waterford] personnel than the traditional RF audit process does by many times over.

Economic Sustainability

- Economic sustainability involves the use of available resources in a way that is both efficient and responsible and ensures all financial obligations over time can be met.

Four steps towards a more sustainable global economy

- 1) Diversify economies ... development strategies are not implemented overnight
- 2) Stem the rise of inequalities
- 3) Make finance sustainable
- 4) Improve institutions

The ongoing development of the RFIS™ technology by Waterford has been consciously conceived with the subject of “sustainability” in mind. RFIS™ actively delivers direct benefits in the areas of *environmental, human, and social* sustainability – as has been pointed out above. However, as with any technology that addresses a human concern and delivers a multifaceted solution, the subject of its *economic* impact is inescapable – if not of primary importance. When all is said and done and the numerous benefits associated with RFIS™ deployment are considered, commercial enterprise clients want to know, ‘*will RFIS save me money?*’

The answer is a resounding “YES”. The RFIS™ system is available to any interested buyer or client as a capital-purchased asset or in the form of a *managed service* with a familiar and affordable, monthly lease payment. The “cost” of deploying RFIS™ on any wireless site should never be an obstacle or negating factor.

Manufacturing RFIS™ helps keep US-based manufacturing personnel employed. Engineering sites for RFIS™ deployment employs specialized personnel specifically hired to serve the RFIS™ team. Installing RFIS™ requires dedicated field personnel. Monitoring RFIS™ activity after deployment also requires dedicated technical service personnel. All of these well-paying jobs contribute to an enhanced economy, both in the local community – as well as globally.



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Inequality directly threatens democracy, as it erodes the middle classes, increases social polarization and fuels political mistrust.² The contributions made by RFIS to directly addresses this issue are described in the second bullet point under the previous section on “Social Sustainability”.

The cost of manufacturing is made more affordable when large volume production occurs, which requires significant financial investment by Waterford. As a result, Waterford maintains relationships with several banking institutions and finances much of the RFIS material procurement and production.

In the end, institutions experience improvement because RFIS is contributing not only to the enhancement of a “game-changing” solution and approach toward RF compliance within the wireless industry, but directly creating awareness regarding RF exposure and safety and delivery ways in which RF exposure and human safety is characterized and managed by the occupational community and general public alike.

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