White Paper

# teamplay

## Overview about Euratom directive

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# Content


| | |
|---|---|
| Introduction | 3 |
| The Euratom directive | 4 |
| How can teamplay support you? | 6 |
| What else you need to know | 12 |

# Introduction

The cloud-based solution teamplay can help you to make prompt and well-informed decisions by offering an intelligible overview of your radiology device performance data. It monitors quantities such as dose levels or imaging throughput of your whole fleet down to every device, simplifying your reporting and showing you where workflows need adjustments. It links you to other users of teamplay and offers an effortless exchange of images and reports with other healthcare providers.

Currently, there's an increasing interest in radiation dose monitoring and management because of legal regulations and concerned patients.

As, in general, patient care remains a primary concern, you are obliged to follow legislation and regulations in order to apply the right dose for each patient. An important and fundamental principle is the ALARA (As Low as Reasonable Achievable) principle. It is the basis for keeping the amount of emitted radiation dose as low as possible – and for achieving the right balance between applied radiation dose and image quality.

Constant monitoring of the applied radiation dose is key to reach for an optimum in patient care. Radiation dose outliers are triggers to start scrutinizing data. The question arises: Is the patient's habitus the cause of an elevated radiation exposure, or might a faulty scan protocol be the trigger?

Overall, this means that whether during the selection of the scan protocol, the parameter modification at the scanner, the examination itself or review of applied radiation dose values, transparency is important.

# The Euratom directive

The European Commission published a directive that covers these topics. A directive is one of the legal instruments available to the European institutions for implementing European Union policies. It is a flexible instrument mainly used as a means to harmonize national laws. It requires EU countries to achieve a certain result but leaves them free to choose how to do so.[1] It can be distinguished from regulations which are self-executing and do not require any implementing laws in the member states.

The aim of the 2013/59/Euratom directive is to define basic safety standards for the exposure of workers and the general public against the dangers of ionizing radiation. Among other things, it contains new stipulations for recording and documenting dose levels that occur during medical procedures, as well as for the use of diagnostic reference values. Because the justification of each individual medical exposure plays a major role in the directive, each administered dose has to be documented and, if necessary, annotated.

When it comes to radiation dose monitoring, the following articles and paragraphs of the directive, out of the Official Journal of the European Union (17.1.2014), are the most important to understand:

## Article 56: Optimization

**Art. 56 §2:** a regular review and the use of reference values.

Regularly review emitted radiation and injected dose and compare dose with dose reference levels (DRL).

"Member States shall ensure the establishment, regular review and use of diagnostic reference levels for radiodiagnostic examinations, having regard to the recommended European diagnostic reference levels where available, and where appropriate, for interventional radiology procedures, and the availability of guidance for this purpose. […]"

## Article 58: Procedures

**Art. 58 d:** a medical physics expert is appropriately involved.

"Member States shall ensure that: in medical radiological practices, a medical physics expert is appropriately involved, the level of involvement being commensurate with the radiological risk posed by the practice […]"

**Art. 58 f:** a corrective action is necessary when consistently exceeding reference values.

"Member States shall ensure that: appropriate local reviews are undertaken whenever diagnostic reference levels are consistently exceeded and that appropriate corrective action is taken without undue delay."

## Article 63: Accidental and unintended exposures

**Art. 63 c:** For all medical exposures the institution needs to implement an appropriate system for the record keeping and analysis of dose events.

"[Member States shall ensure that] for all medical exposures the undertaking implements an appropriate system for the record keeping and analysis of events [...]"

# How can teamplay support you?

How can teamplay help you and other operators of radiological imaging facilities to manage radiation dose?

## Article 56: Optimization

**Art. 56 §2: a regular review and the use of reference values.**

teamplay Dose offers an up-to-date, dynamic report in a defined time frame of radiation dose values in your imaging fleet, to regularly review emitted and injected radiation dose. Data from different modalities, such as CT scanners, angiography and mammography equipment for example can be processed and as teamplay is a cloud-based solution you can have access to your data even when you are not close to the imaging device.

teamplay uses the common DICOM standard Dose Reports, DICOM header information and OCR (optical character recognition) for gathering all the information and due to the fact that DICOM is an international technical standard, data from other vendors besides Siemens can be processed as well.

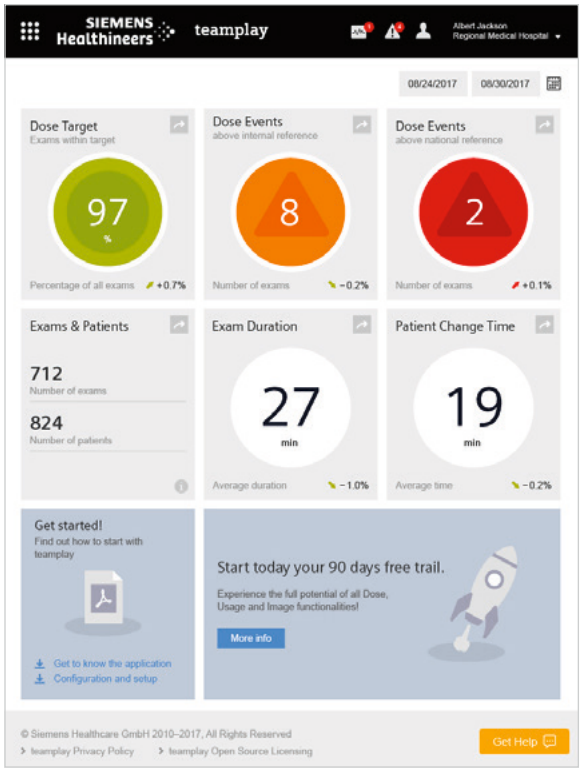


**Fig. 1:** After logging on to teamplay, the home screen shows clearly all key performance indicators of your institution at one glance, including radiation dose..

## Article 58: Procedures

**Art. 58 d: a medical physics expert is appropriately involved.**

The expert in the institution shall be involved as appropriate for consultation and advice on matters relating to medical exposure.

teamplay Dose helps the expert to compare radiation dose levels with national reference level, which automatically updated by Siemens Healthineers in regards to latest regulations.

In addition the expert is able to set own institutional reference level to further work on the ALARA principle.

The dashboard on the teamplay home screen indicates how many examinations have exceeded the national reference level or the internal dose target within a defined time period [Fig. 2].

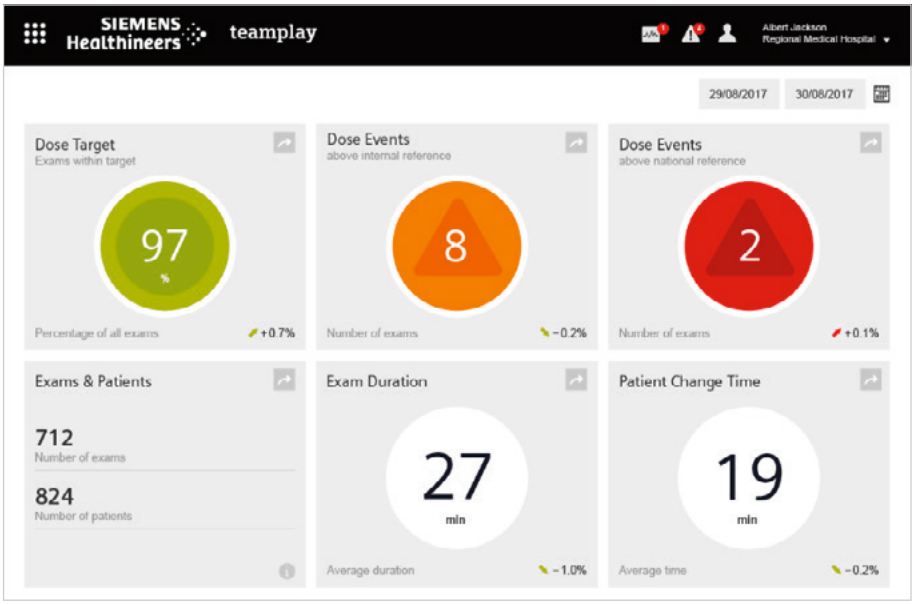


**Fig. 2:** The dashboard clearly displays that 2 dose events exceeded the national reference level during the selected time frame.

The tile shows as well the trend by comparing the very same time period prior to the selected time period. By clicking on the tile, in-depth information such as scan protocol parameters can be obtained.

Based on the outcome, dedicated measures like adaptation of a scan protocol can be commenced to reduce the number of dose events and so the overall radiation dose performance may improve.

### Article 58: Procedures

**Art. 58 f: a corrective action is necessary when consistently exceeding reference values.**

Member states need to take corrective action, but already on an institutional level. teamplay Dose might drive corrective measures when needed. teamplay Dose clearly lists and displays all dose outliers. From the dashboard, a deep dive, down to the level of a single examination, is possible.

Based on the data teamplay delivers for example the following specific information:

- Operator
- Location
- Modality type
- Body region
- Scan protocol
- Study date and time
- Patient ID

To objectively compare the dose values of the protocols from your facility with those of other facilities, users can utilize teamplay to assign the clinical question or purpose of the examination to their protocols, regardless of their own protocol names and in accordance with the Radlex playbook. The playbook is a terminology and ontology database for radiology developed by the RSNA. Playbook provides a standard system for naming radiology procedures, based on the elements that define an imaging exam such as modality and body part. By providing standard names and codes for radiologic studies, Playbook can facilitate a variety of operational and quality improvements, including workflow optimization, charge master management, radiation dose tracking, enterprise integration and image exchange

### Article 63 Accidental and unintended exposures

**Art. 63c: For all medical exposures the institution needs to implement an appropriate system for the record keeping and analysis of dose events.**

With teamplay in place a modern, state of the art system delivers access and keeps track on events with emitted radiation and injected dose.

After reviewing and investigating all information on dose outliers, it is possible to annotate them. [Fig. 3] [Fig. 4].

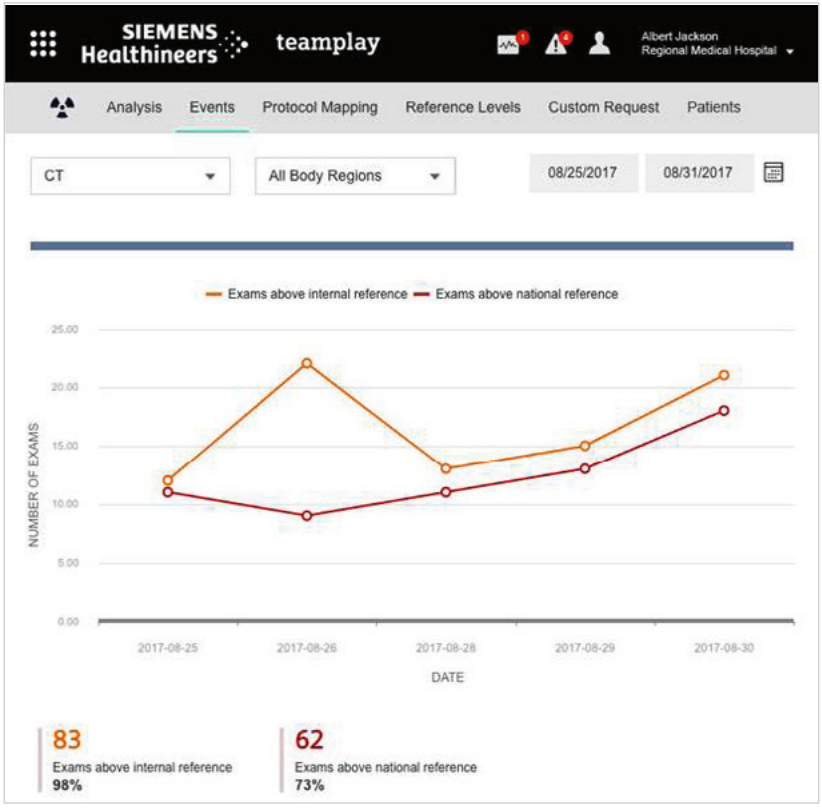


**Fig. 3.1:** The graph shows how many exams exceeded the internal or national reference levels and on which exact date.

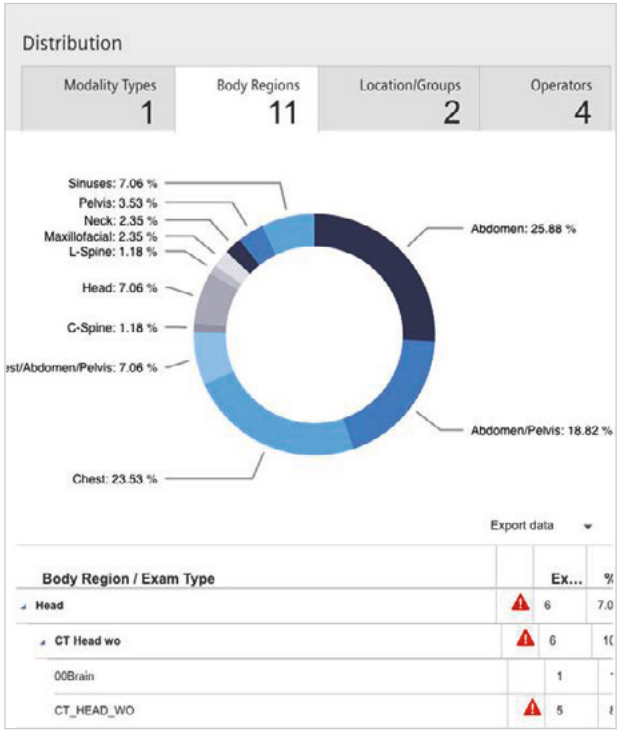


**Fig. 3.2:** A detailed view on all body regions and exam types with the option to directly access individual cases.

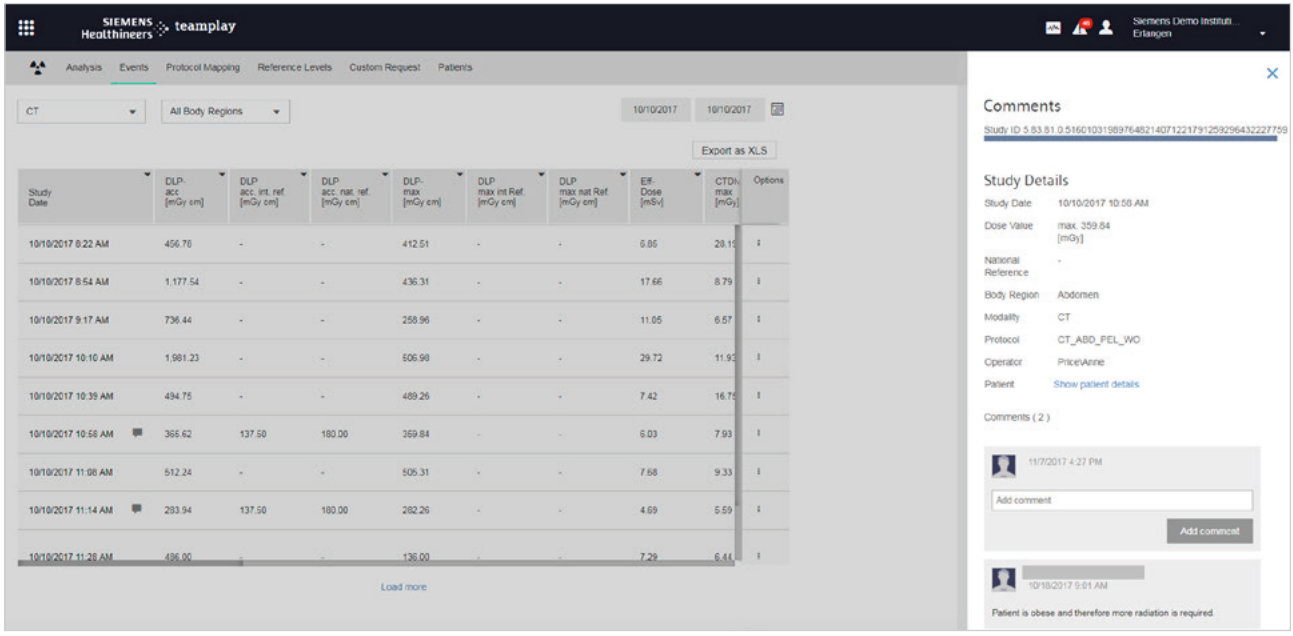


**Fig. 4:** A list of all dose outliers. Comments can be added to individual events at the expandable side pane. Once a comment to a dose event is added, it is clearly marked in the list.

Finding the cause of each dose outlier provides a solid basis for suitable countermeasures. If the cause for a dose outlier can be attributed to a faulty CT scan protocol, for example, users can use teamplay Protocols[2] [Fig. 5] to immediately access the protocol parameters saved in the CT scanner and initiate measures to optimize the scan protocol . teamplay Protocols can even support with the distribution of standardized scan protocol among the compatible Siemens CT scanners within your modality fleet.

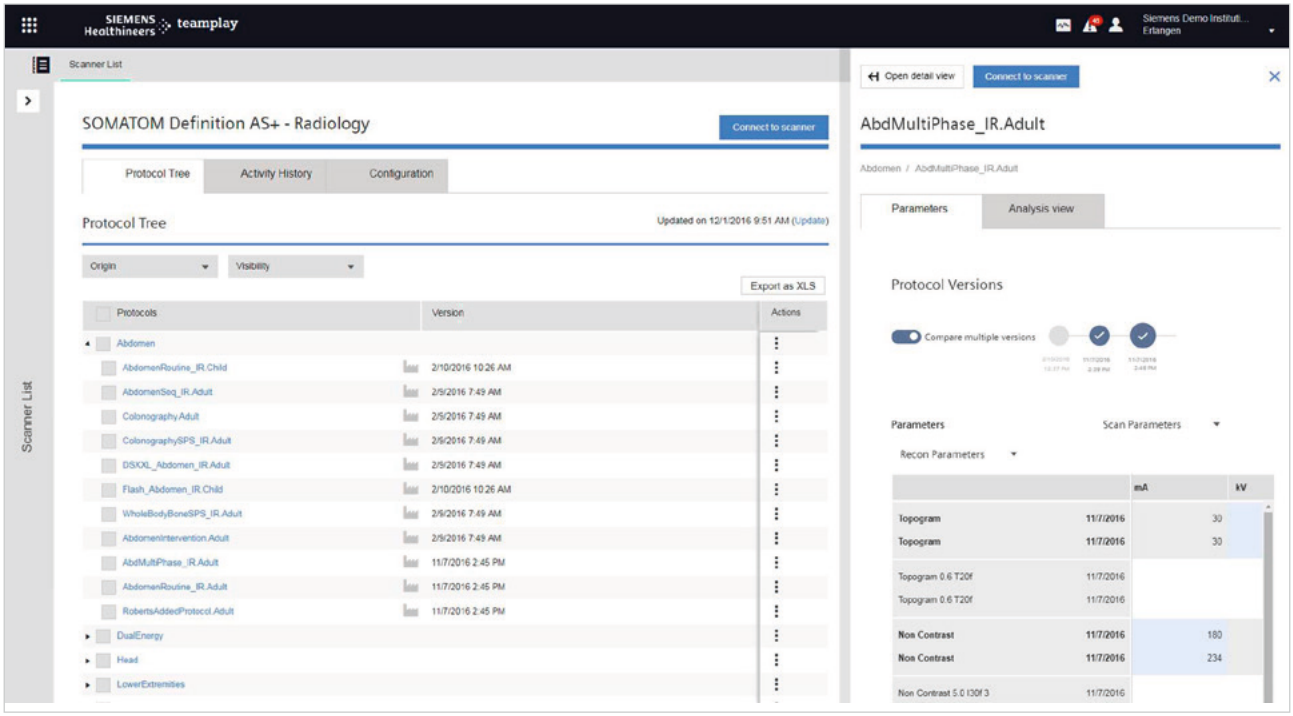


**Fig. 5:** A detailed overview of the protocol tree shows all scan and reconstruction parameters even of previous protocol versions.

# What else you need to know

teamplay is a cloud-based network, basing on Microsoft Azure, for physicians, medical professionals, medical physics, and decision-makers in healthcare. It allows easy evaluation of capacity utilization for imaging equipment, various workflows, and individual tests and examinations. With just one click, it is also possible to compare anonymized data with values of different satellite departments in larger integrated delivery networks (IDNs) or hospital chains.

**teamplay today offers:**

- teamplay Usage provides seamless access to your institution's performance and beyond. It helps you refine your imaging efficiency and identify precise starting points for enhancing efficiency.
- teamplay Dose offers at-a-glance insight into your current radiation dose levels and into deviations from both internal and national thresholds. Drill-downs allow in-depth analyses and comparisons that will both pinpoint issues and help decision-makers outline measures to resolve them.
- teamplay Images[3] is a one-stop offering for imaging studies, designed for quick and easy Web access from your device of choice. Collaboration features help you engage in professional discourse in a secure environment and pool expertise with staff and peers to finally improve patient outcomes.
- teamplay Protocols gives you a clear picture of the scan protocols installed in your imaging fleet[2].

Thanks to centrally controlled software updates and upgrades, as well as an easy-to-understand structure, teamplay can be used without the need of advanced training. The network is connected to the imaging equipment or the PACS via a receiver, so it can – depending on the adjustment of the receiver – send DICOM (digital imaging and communications in medicine) data from the connected systems into the teamplay cloud. For research and teaching purposes, doctors can additionally use the secure cloud to share clinical studies with colleagues[3]. teamplay from Siemens Healthineers is already being used at more than 16 00 clinical locations worldwide. teamplay has been awarded the German "Seal of Privacy for IT products" by the Independent Centre for Privacy Protection Schleswig-Holstein (ULD), as well as the European Privacy Seal (EuroPriSe)[4]. As such, the processing of patient data complies with the data protection regulations of Germany and the EU.

For further information about teamplay and its different applications, please visit the following website:

**www.siemens.com/teamplay**

On the website you can register yourself and/or your institution so that you have the opportunity to start working with teamplay straight away.

1 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02013L0059-20140117

2 teamplay Protocols supports selected Siemens scanners. Please contact your Siemens representative for more details.

3 teamplay Images is not intended for diagnostic display.

4 teamplay – CORE applications: teamplay Dose, teamplay Usage, and teamplay Protocols – has been awarded the European Privacy Seal and the German "Seal of Privacy for IT products" of the Independent Centre for Privacy Protection in Schleswig-Holstein (ULD).
All product images are created in a demo environment.

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