Second yearly release of AW-Drones Repository

D6.3

AW-Drones

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AW-Drones

CONTRIBUTING TO A WELL-REASONED SET OF AIRWORTHINESS STANDARDS FOR MASS-MARKET DRONES

Abstract

This document presents the second version of the AW-Drones open repository. The AW-Drones open repository is an online platform where users are able to easily identify relevant information from the AW-Drones database of standards and regulations. Since the nature of this report is "Websites, patents filling, etc.", this document presents some basic screenshots of the platform and it presents the URL that will be used to promote the portal. The next steps are:

- to promote the AW-Drones repository in the user community,
- to maintain and update the existing information,
- to implement a portal sustainability plan as this has been defined by the AW Drones consortium.

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Executive Summary

This document presents the second version of the AW-Drones open repository. The AW-Drones open repository (second version available here: http://standards.aw-drones.eu) is an online platform that provides a single point of access to relevant information about:

- rules, procedures and technical standards developed for civilian drones;
- best practices, gaps and bottlenecks;
- technical standard for each category of drone operations.

The repository will become the main legacy of the AW-Drones project, containing all standards information collected and curated by the consortium. The portal is aiming at becoming a relevant drone focused informative tool while fostering enhanced awareness of relevance of drones and related opportunities, applications, products and services.

The next steps are:

- to promote the AW-Drones repository in the user community,
- to maintain and update the existing information,
- to implement a portal sustainability plan as this has been defined by the AW-Drones consortium.

1 Introduction

1.1 Purpose and Scope of this document

The purpose of this document is to briefly present the AW-Drones open repository that is developed in AW-Drones project and acts as the synthesis for the whole project. According to the Grant Agreement, the nature of this report is "Websites, patents filling, etc.". The URL of this second version of the AW-Drones repository is available here: http://standards.aw-drones.eu.

The repository will become the main legacy of the AW-Drones project, containing all standards information collected and curated by the consortium. The repository is aiming at becoming a relevant drone focused informative tool while fostering enhanced awareness of relevance of drones and related opportunities, applications, products and services. It will be an online platform where users are able to easily identify relevant information from the AW-Drones database of standards. The development of this platform focused on the following key principles: a) focus on the user, b) focus on quality, c) keep UI simple, d) think long term (exploitation prospects of AW-Drones). To accomplish this, the platform has been developed in several iterations, with a first full version available in June 2020, and a second version with the end of the project (December 2021).

After the initial release of the portal on the 30th of June 2020, it was presented in numerous occasions internally to the project and to the user community (such as EASA), including project meetings and project workshops with external actors in August 2020, November 2020, February 2021, April 2021, July 2021, November 2021 and December 2021. Further to this, the portal was promoted through the beneficiaries' networks, and through personal contacts. The goal was to receive feedback on its functionalities and ease of use before making it widely available, as well as to understand of any missing user requirements. The feedback that was collected was presented, discussed, and assessed by WP6 leader Ortelio and the project coordinator, DeepBlue, in a series of meetings that took place from July 2021 to December 2021. During this time a second round of development by Ortelio took place, which was also supported by Deep Blue which provided extensive feedback and visual elements for the portal, as well as by partner TU Delft which provided appropriate textual information (user manual).

The next steps are:

- to promote the AW-Drones repository in the user community,
- to maintain and update the existing information,
- to implement a portal sustainability plan as this has been defined by the AW Drones consortium.

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1.2 Deliverable Structure

This document is divided in three different sections.

Section 1 defines the main scope and objectives of this deliverable. Section 2 provides some screenshots of the AW-Drones repository. Section 3 present the repository's User Manual.

1.3 List of Acronyms

AEH	Airborne Electric Hardware
ANSP	Air Navigation Service Provider
ATM	Air Traffic Management
ATS	Air Traffic Services
C2	Command and Control
CA	Consortium Agreement
DoA	Description of Action
EASA	European Aviation Safety Agency
EC	European Commission
GA	Grant Agreement
HMI	Human Machine Interface
IFR	Instrument Flight Rules
RPAS	Remotely Piloted Aircraft Systems
RPS	Remote Pilot Station
UI	User Interface
UAS	Unmanned Aircraft System
UTM	UAS Traffic Management
VLL	Very Low Level
WP	Work Package

2 The AW-Drones repository

2.1 Purpose of the platform

The AW-Drones project has collected and assessed already published or under development standards against existing and foreseen regulations. During this process, the project identified:

- Rules, procedures and technical standards developed for civilian drones.
- Best practices, gaps and bottlenecks.
- Technical standards for each category of drone operations.

The intent is to make this data available through a single point, user-friendly online platform, which can be accessed freely and globally by any type of user. The objective is for the AW-Drones' Drone Standards Information Portal to become a recognized informative tool where experts can identify relevant information, and non-experts can learn about drone regulations.

2.1.1 Coverage of Market Gap

The Drones Standards Information Portal addresses existing market gaps such as the dissemination of standards for civil drone operations. These gaps and the respective solutions provided by the portal are presented in Table 1.

Table 1: Market gaps covered by the Drone Standards Information Portal

Market gap	Solution provided by the portal
Collection of all available standards from different sources is often a time-consuming task.	The portal is a single source of information. Visitors can use search bars and links to quickly find information on a standard.
Acceptable means of compliance may vary significantly due to the issues emerging in each country in response to the market needs of both manufacturers and operators.	The portal clearly identifies the acceptable means of compliance. Moreover, as users from different countries access the portal, it may lead to a stronger collaboration and the development of harmonized approaches.
Information regarding the status of a standard is often not available.	The portal displays information on standards' maturity level, coverage of regulation, and identified gaps. Moreover, the portal shall be maintain and updated frequently.
Comprehension of the documents composing the SORA specification or other standards may be difficult for a reader without previous	The portal offers small and clear descriptions of each OSO and standard.

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technical knowledge.	
It is time consuming for any user to manually check on different organisations for new projects, work groups, and/or standards.	Having one single point of information facilitates this task.

2.1.2 Purpose per User Target Group

Different target groups with varying informational needs are included in the scope of the portal. Table 2 identifies the purpose of the portal for each target group.

Table 2: Purpose of the Drone Standards Information Portal for each potential user

Potential User	Purpose of the portal
Industry: • Drone operators • Drone manufacturers • Qualified entities • Notified bodies • Regulatory consultants	Industry needs clear guidance on how to mitigate the risk of the intended civil drone missions. The portal reduces the time and cost of justifying compliance by providing clear guidance on the standards to be followed. Making it clear for drone designers, manufacturers, and operators which standards are to be applied, will facilitate access to global markets.
Institutional bodies: • National aviation authorities • EASA • European Commission • Standards producing organisations • European Joint Undertakings	Any user can access the portal, no login is needed. Institutional bodies may thus suggest the portal as a clear, easy access tool during their dissemination process.
Research Community: • Research and innovation institutes • Universities • Private research companies	Having one common source of information that both research and industry can access, may improve communication between these two parts as they start from a common, single information point.
General stakeholders: • Public • Media	The availability of a portal where the requirements of civil drone missions are clearly displayed, and how security/safety is guaranteed, will increase social acceptance and understanding of civil drone operations.

2.1.3 Questions Answered by the Drone Standards Information Portal

Many of the questions regarding the certification of civil drone operations can be answered by accessing the portal. Table 3 provides a high-level example of how these questions are answered.

Table 3: Potential questions by users answered by the portal

Question	Answers supplied by the Portal

How to comply with a specific OSO?	The user can select an OSO in the portal and find the necessary AMC.
How to comply with a specific U-SPACE service?	The user can select a U-SPACE service in the portal and find the necessary AMC.
What information is provided by standard X? What is the status of standard X? Is document X a standard or best practice?	The user can quickly access the standard, by searching for the standard's name or document number. Information regarding the aim, current status, and document type of the standard are available on the portal.
Are there new standards applicable for OSO X?	Any user can access the portal and check the available standards.
I'm part of the general audience, and I'm curious about the current regulation for UAS.	The user may search "regulation for UAS" in any search engine (e.g., Google). One of the first results is the AW-DRONES portal. By clicking the link, the user is redirected to the portal where he/she can search through all the data. No login is needed for the website, thus any user can access it.

2.1.4 Expansion to Other Services

The portal has technical requirements that make it possible to use it as a source of information by other digital tools:

- The portal is accessible globally.
- The portal presents all information in English.
- Research data is, as much as possible, 'FAIR' (i.e., findable, accessible, interoperable and re-usable).
- The portal is interoperable and search engines are able to collect its content.

The portal can potentially serve as a database/source for future tools. These tools may communicate with the portal, collect its content, and present it in a relevant way. This is useful for services that provide help with risk assessment and mitigation for civil drone operations.

2.1.5 Technical details

From a technical point of view, an **online repository** is a web-based software application that brings together various data sources to make them available to stakeholders. It allows administrators to publish data to a web portal in order to make it available to the target audience. An **open repository** is a digital platform that provides free, immediate and permanent access to data for anyone to use, download and distribute. To facilitate open access such repositories must be interoperable and search engines must be able to harvest the content of such repositories.

The repository has been developed at http://portal.ortelio.co.uk/ (development version available) and is being published at https://standards.aw-drones.eu/ (fully operational version, promoted to the user community).

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2.2 Functionalities

Below we present screenshots from this second version of the repository.

2.2.1 Frontend

The entry page of the AW-Drones repository (http://portal.ortelio.co.uk/) displays some basic information on its purpose and target groups:

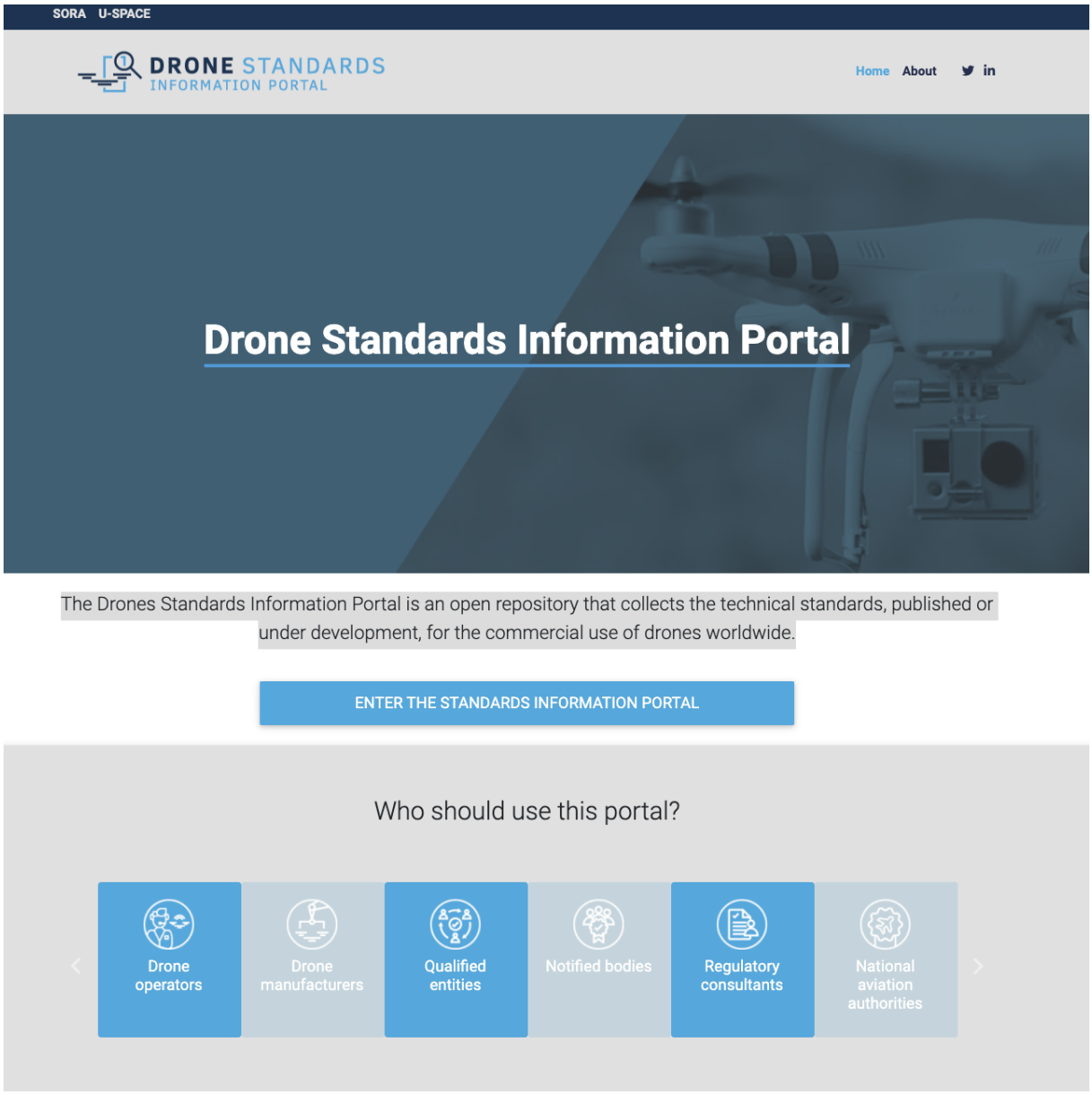

Figure 1. Standards Information Portal (entry page)

The Drones Standards Information Portal provides different search modes in order to support the users' search behaviour, alternating between free search and browse. The user enters the Portal by selecting one of the available regulatory frameworks. Figure 2 presents the home page of the Specific Operations Risk Assessment (SORA) framework.

Figure 2. Specific framework home page

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Users can find information about specific Standards either by navigating through the available categories (Categorised search) or by using the built-in search engine (Free Search).

2.2.1.1 Categorized search

User can select one of the available requirements

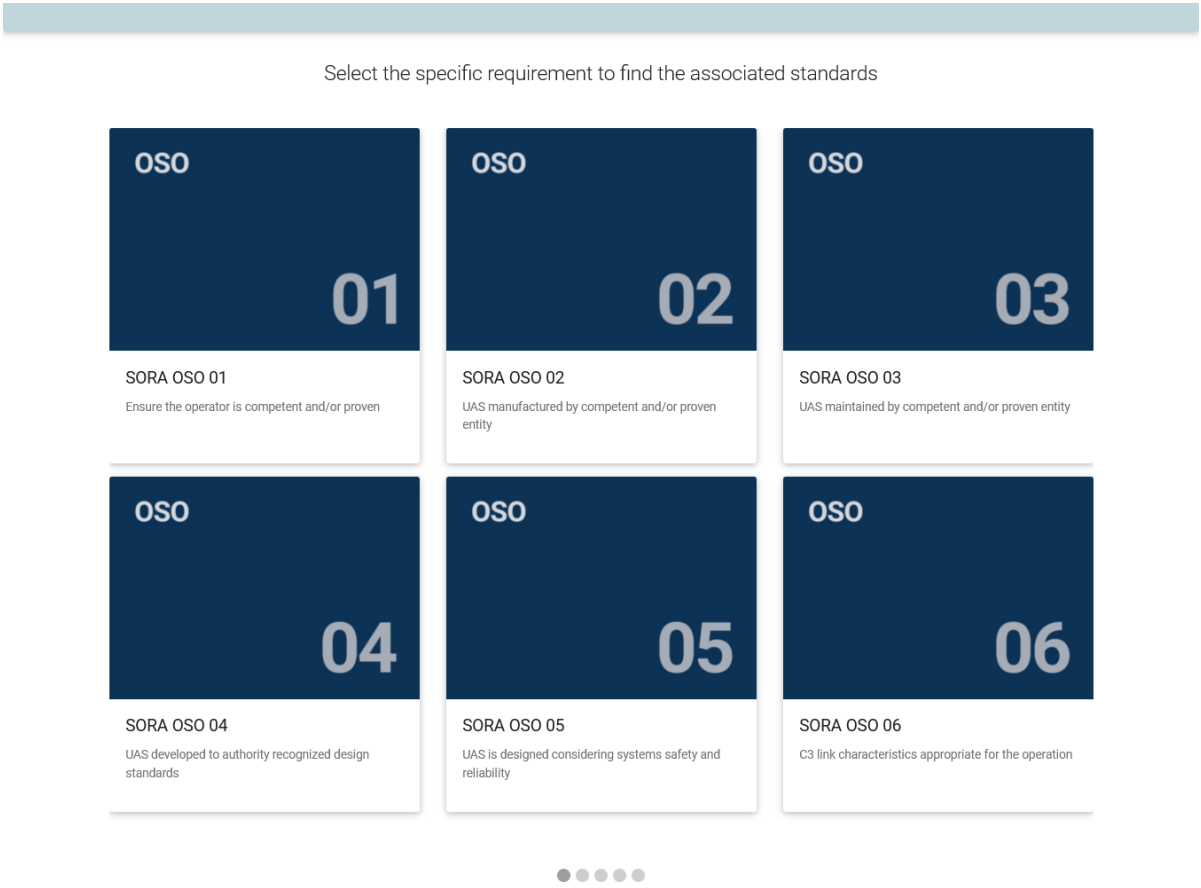

Figure 3. List of requirements

List including the Standards of the specific requirement.

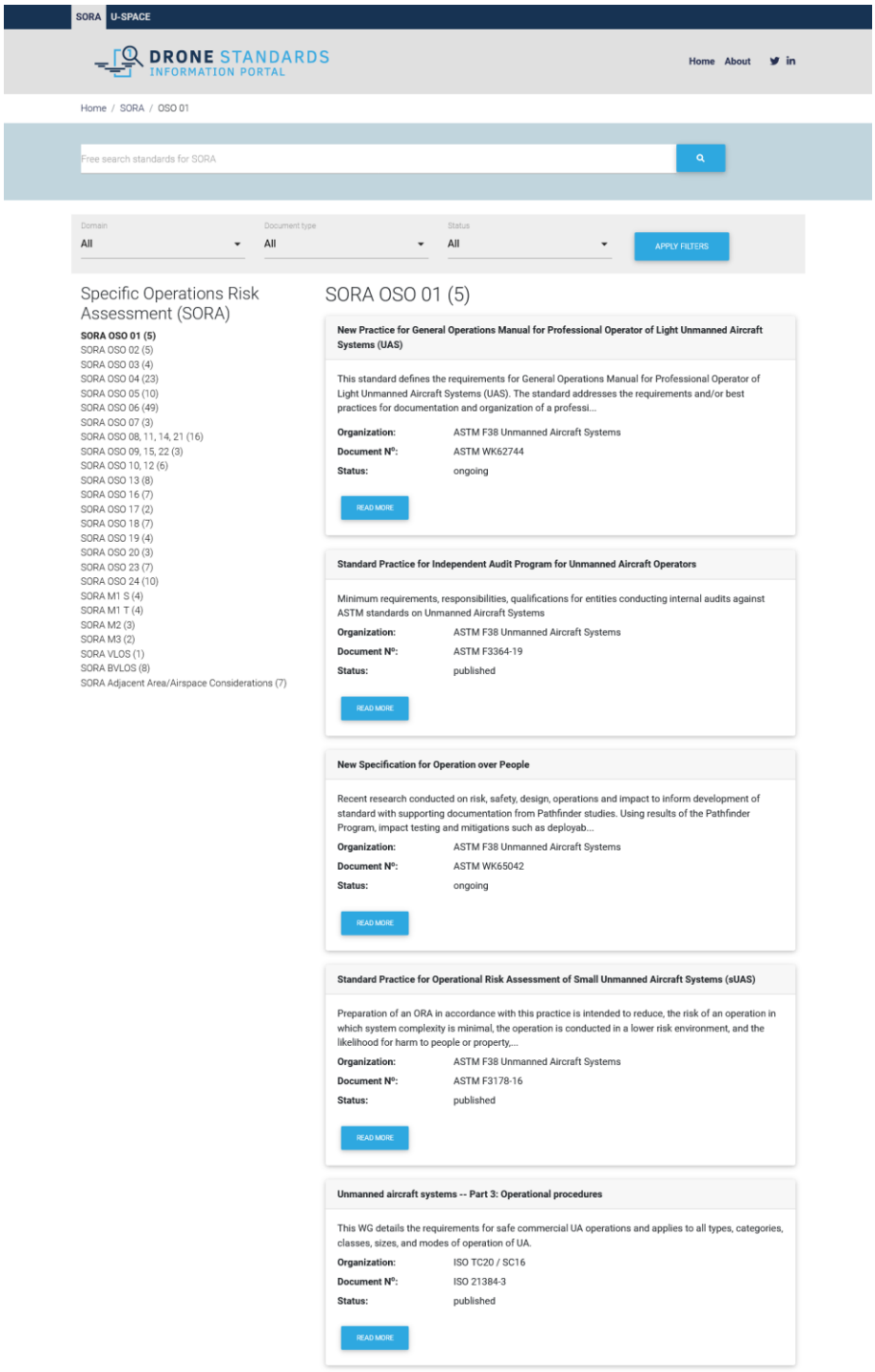

Figure 4. List with Standards

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Users can filter via the Domain, the Document type and the Status of the Standards. They can also navigate quickly to another Requirement by selecting one from the list on the left side of the page.

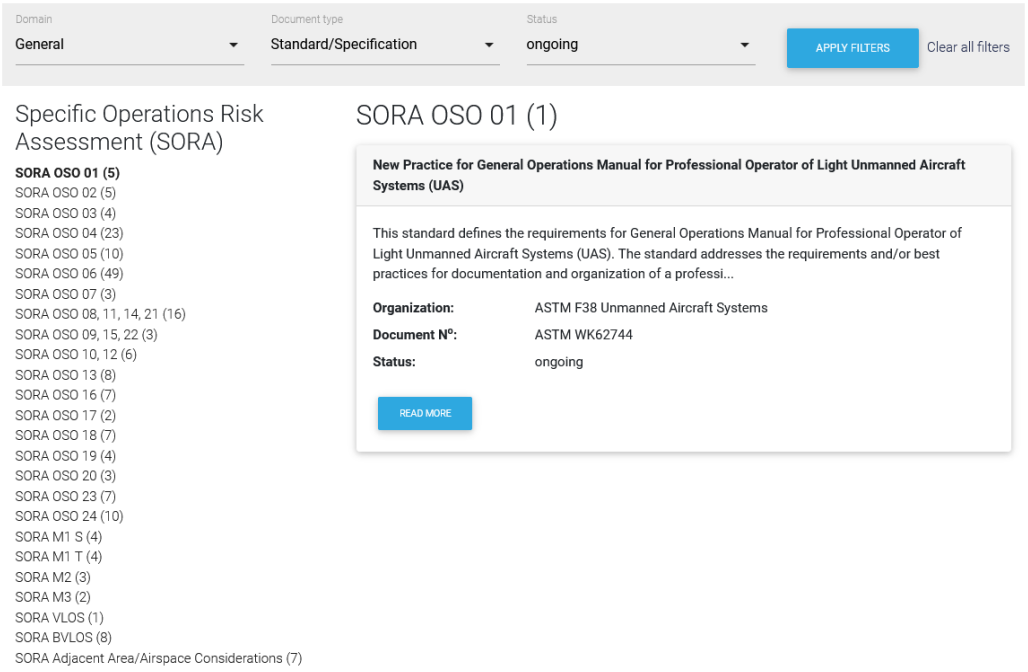

Figure 5. Filtered Standards

2.2.1.2 Free search

The users of the portal can search the Standards of a specific framework, by using the search control, available in every page of the Portal. The search mechanism features autocomplete functionality along with suggestions in order to reduce cognitive demand and provide better results.

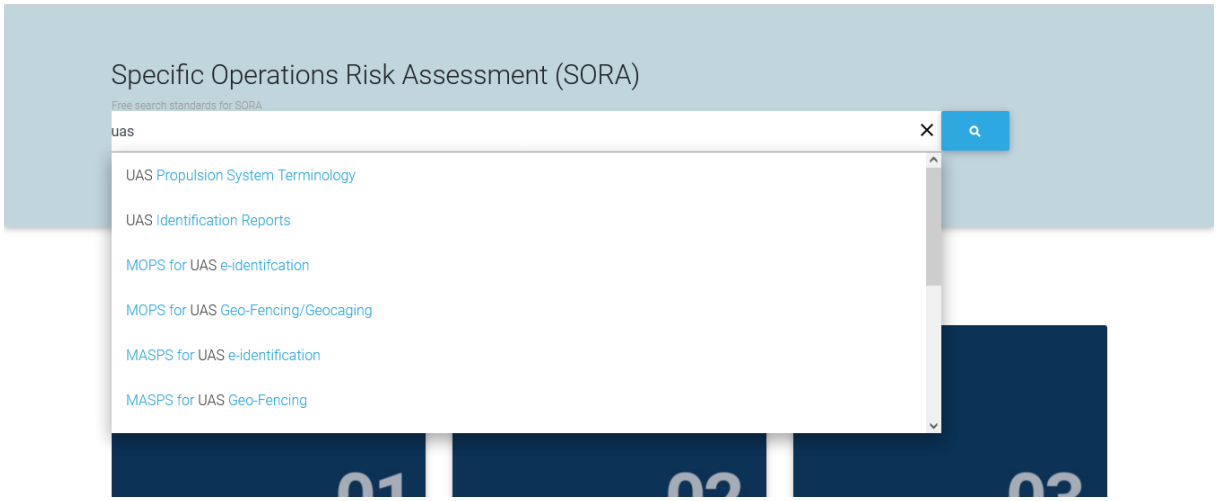

Figure 6. Free search with autocomplete and suggestions

List with the Standards matching the search key phrase entered by the user.

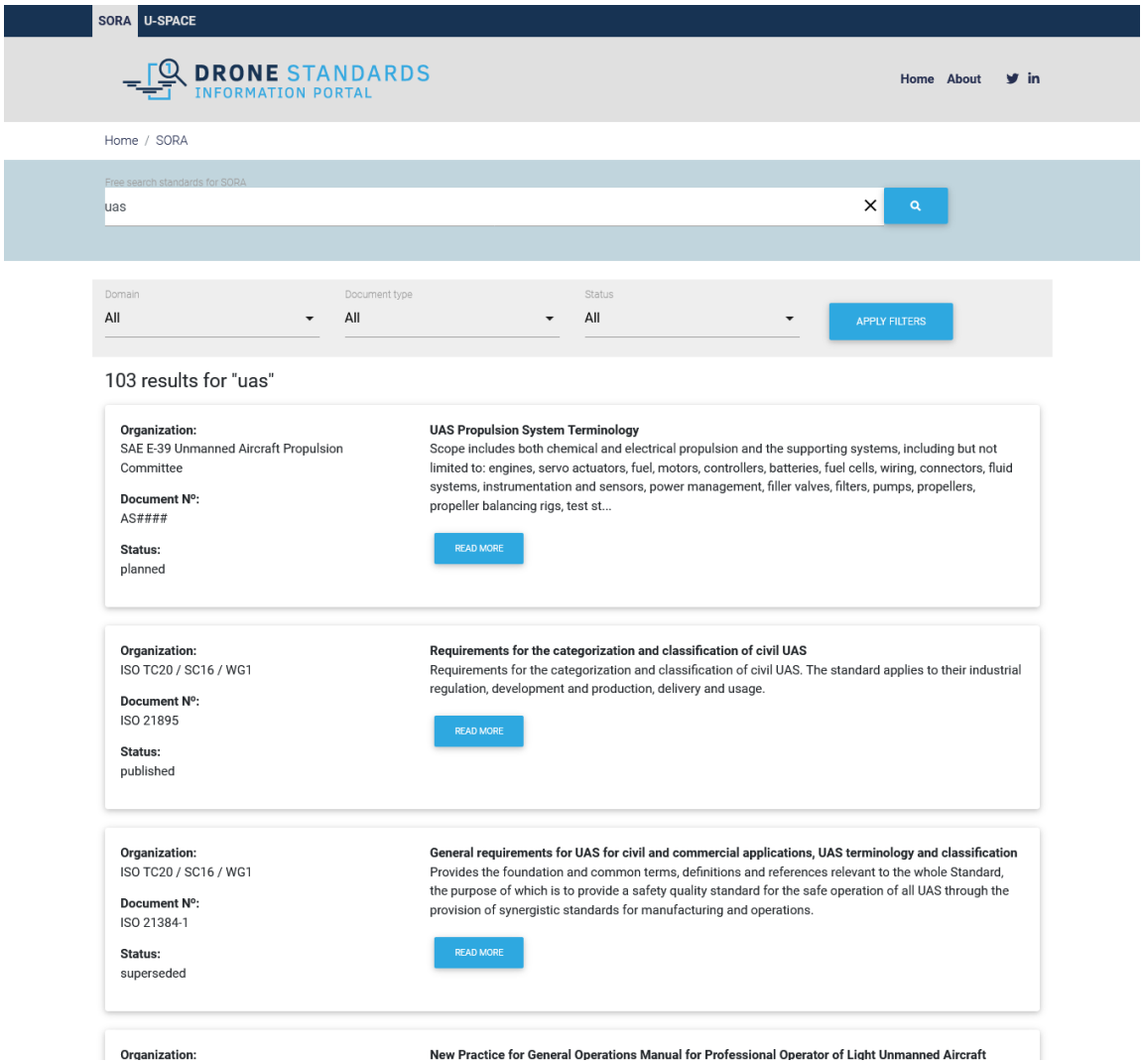

Figure 7. Search results page

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Users can filter the search results via the Domain, the Document type and the Status of the Standards.

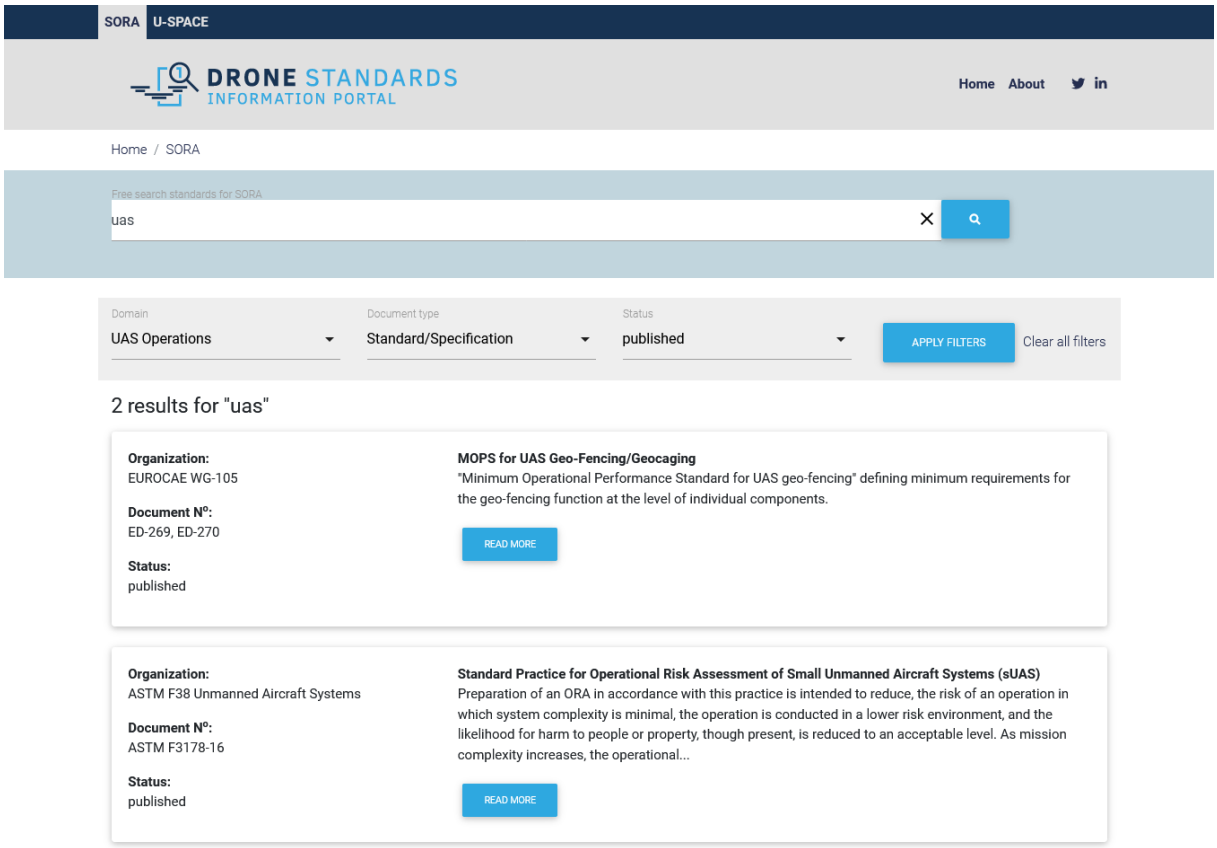

Figure 8. Filtered search results

Users can see all the available information about a specific Standard by opening the detail page. From this page they can make a new search or navigate to the other sections of the Portal.

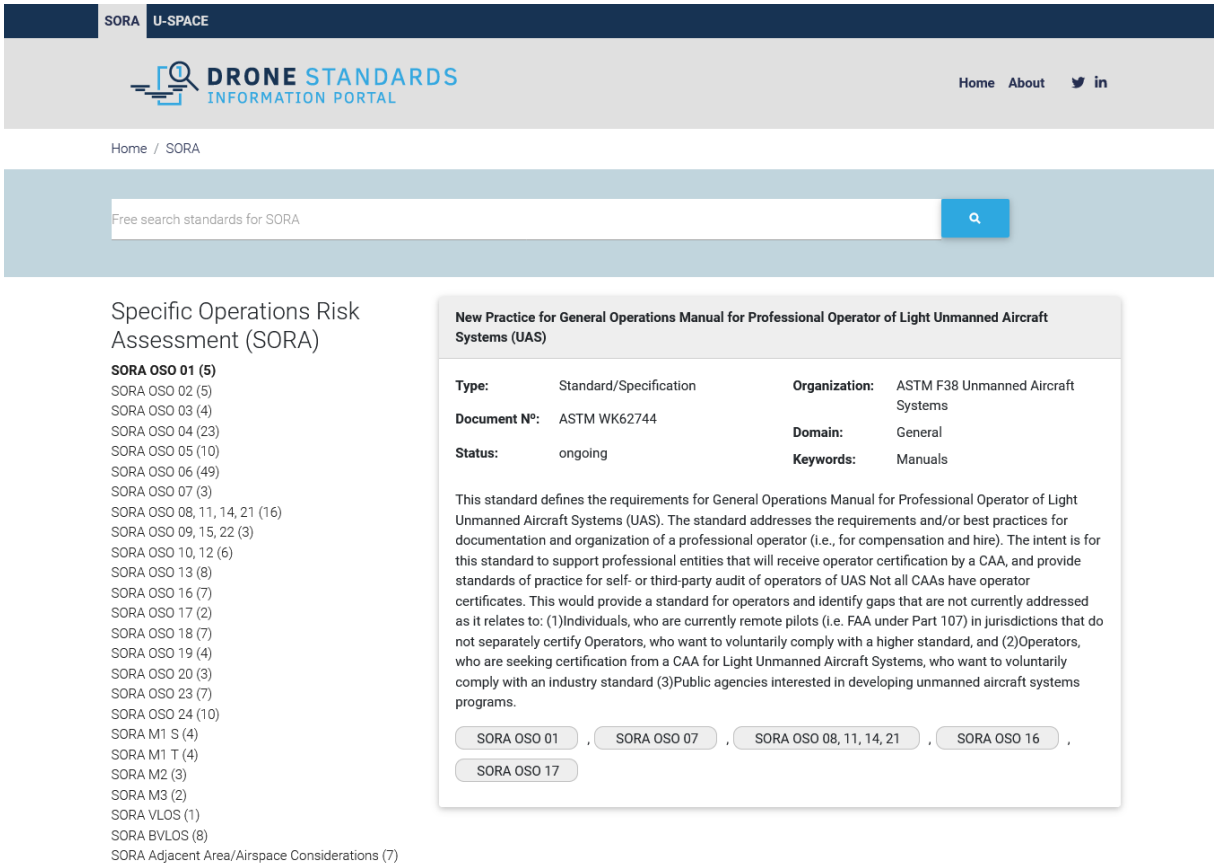

Figure 9. Standard's information page

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2.2.2 Backend

Below we present a list of screenshots that showcase the functionality of the backend environment of the platform. Administrators can login to the platform using their credentials:

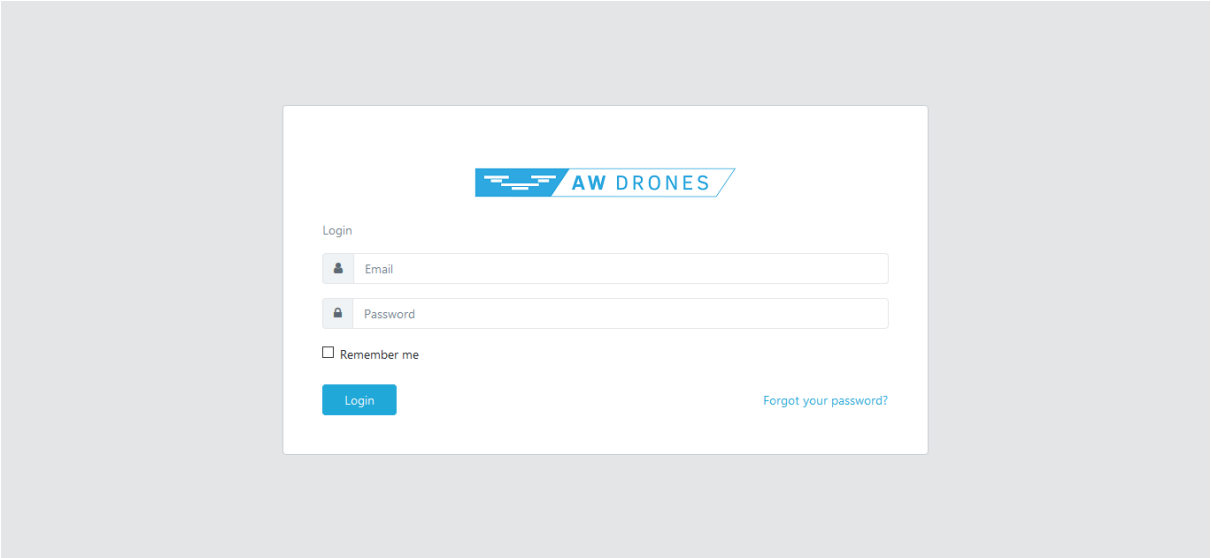

Figure 10. Backend login

This is the dashboard of the administrators:

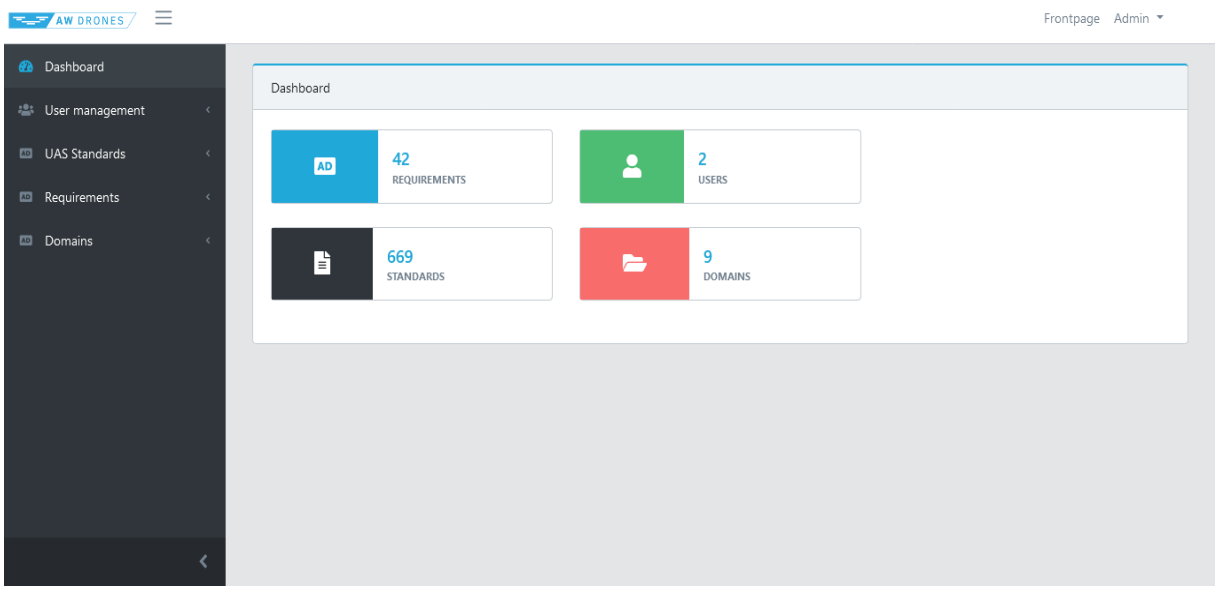

Figure 11. Backend dashboard

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Administrators can manage the users of the platform:

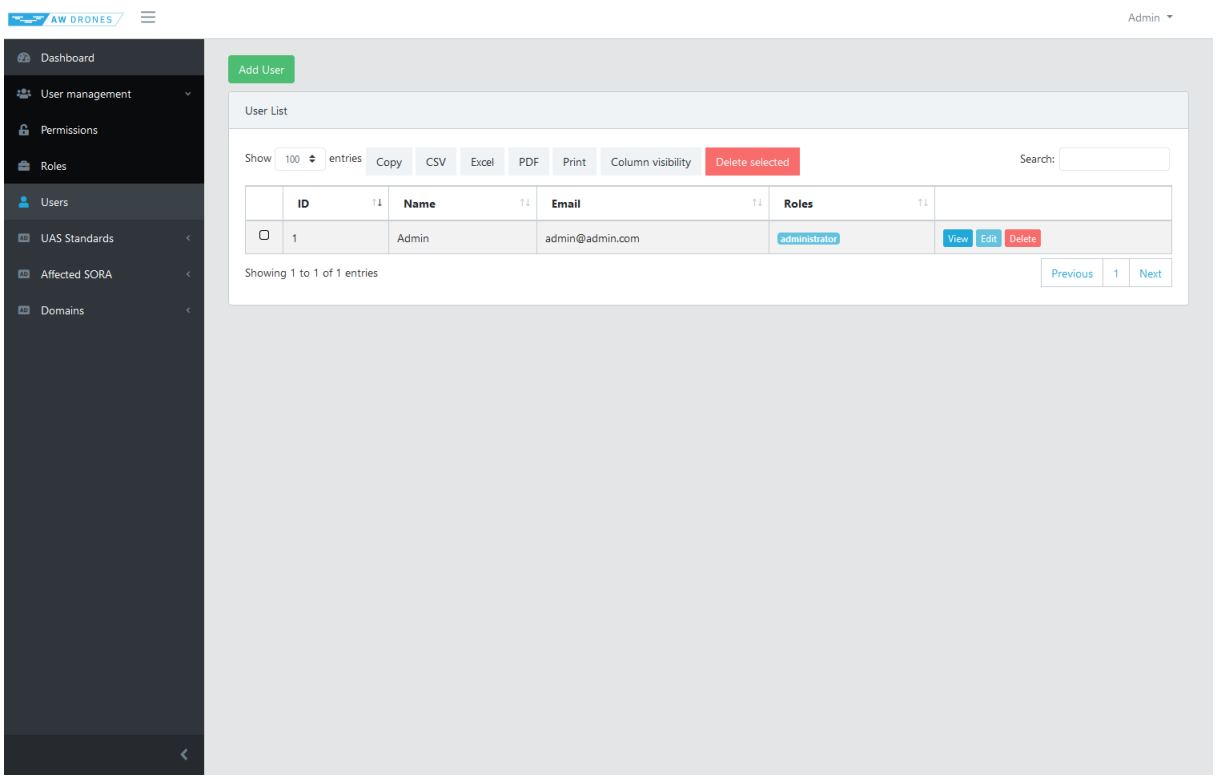

Figure 12. Backend user management

Administrators can manage the roles of the users:

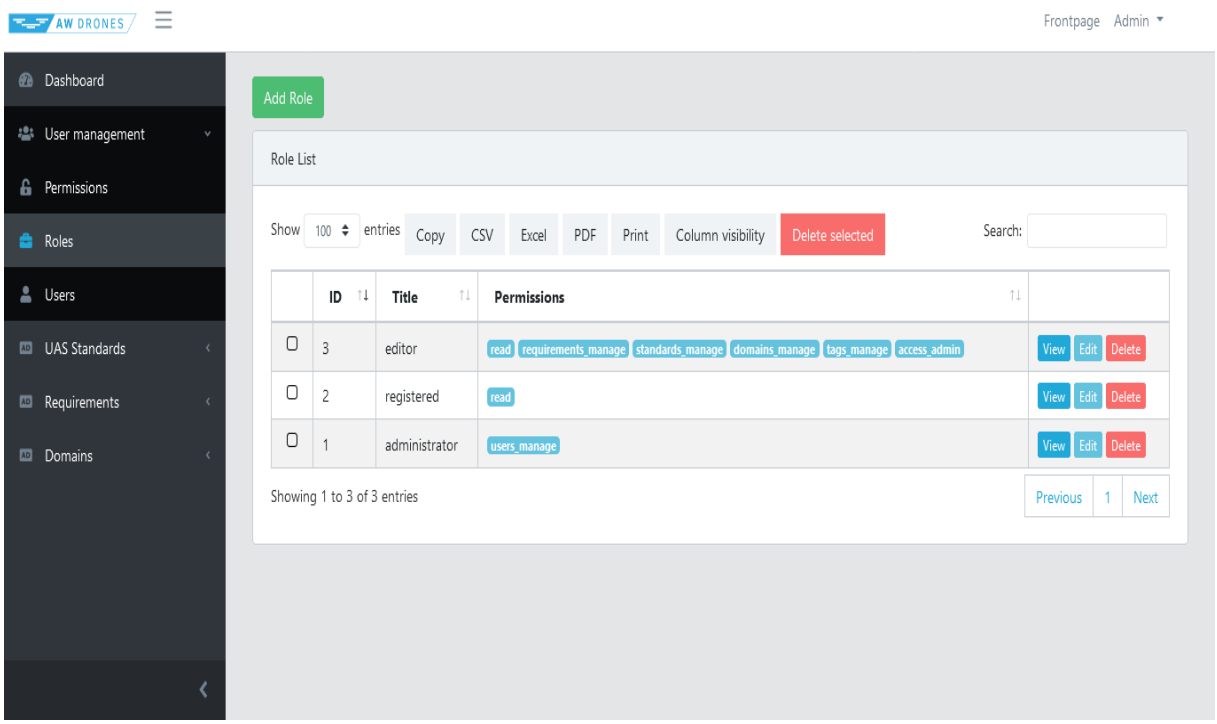

Figure 13. Backend user roles management

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Administrators can manage the permissions of the users:

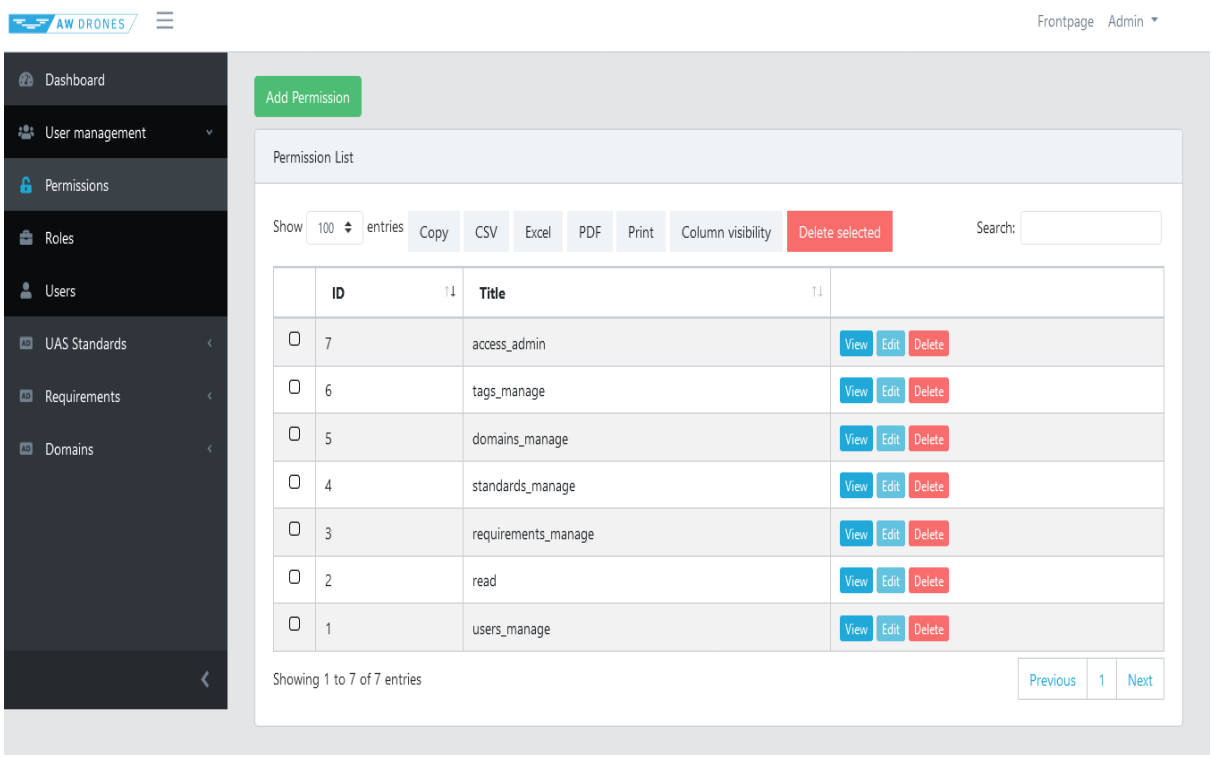

Figure 14. Backend user permissions management

Administrators can easily manage the Domains of the Standards:

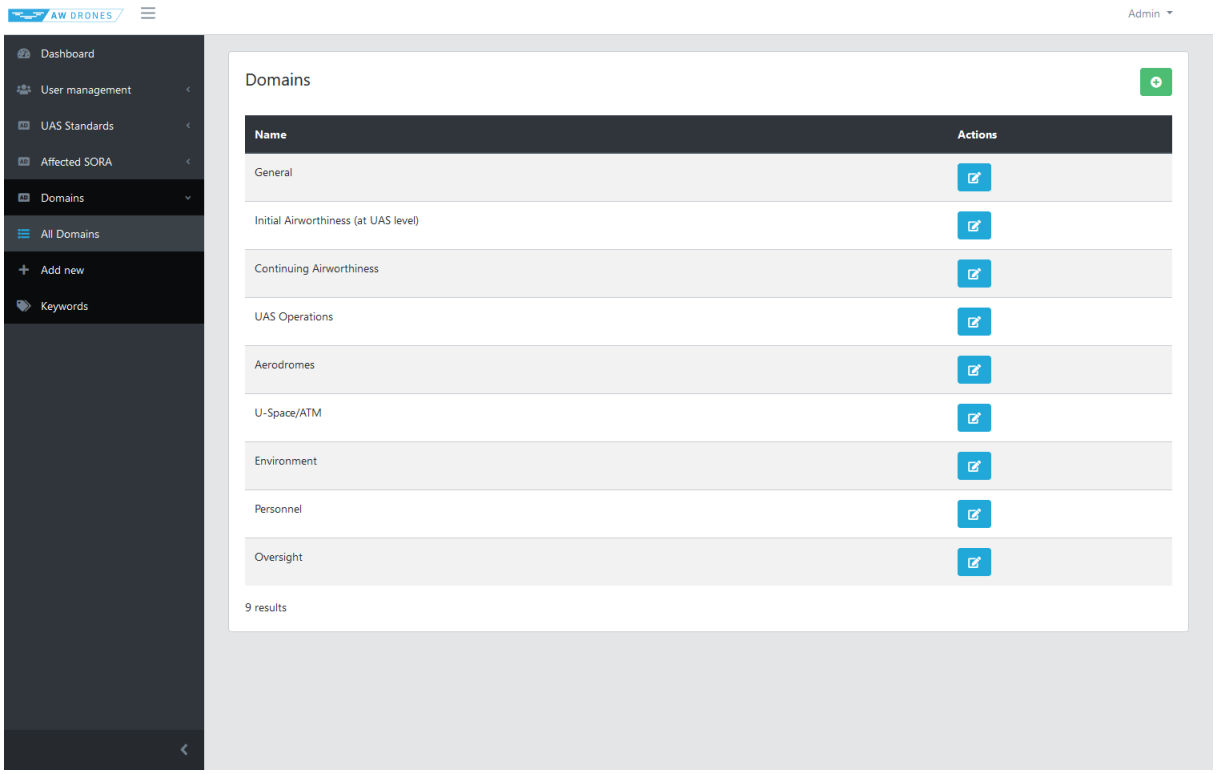

Figure 15. Backend domains list

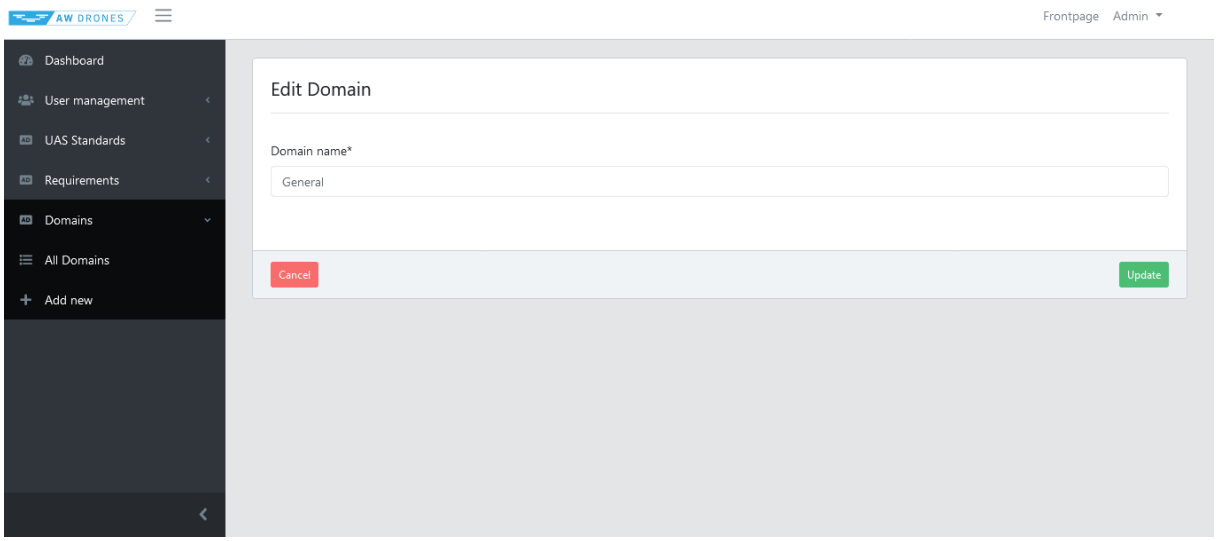

Figure 16. Backend domain add/edit form

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Administrators can manage the keywords:

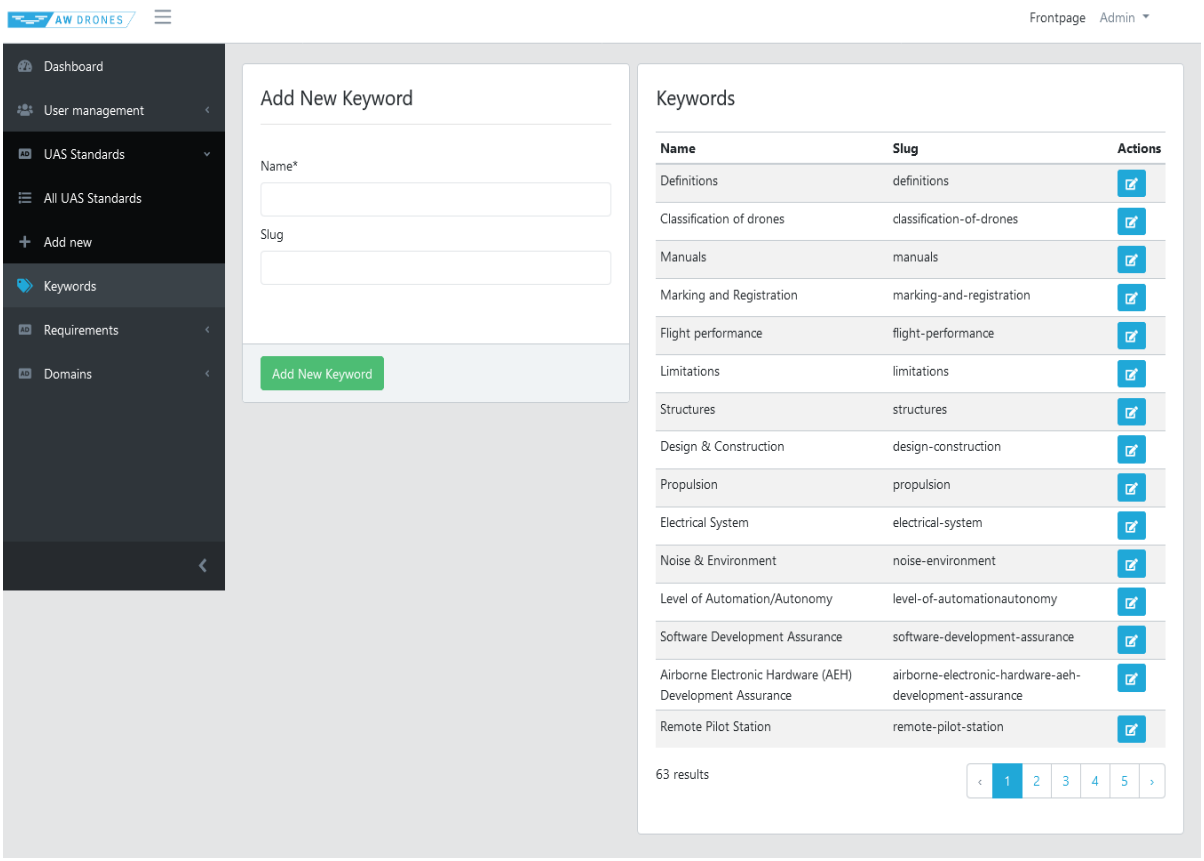

Figure 17. Backend keywords management

Administrators can manage the standards of the repository:

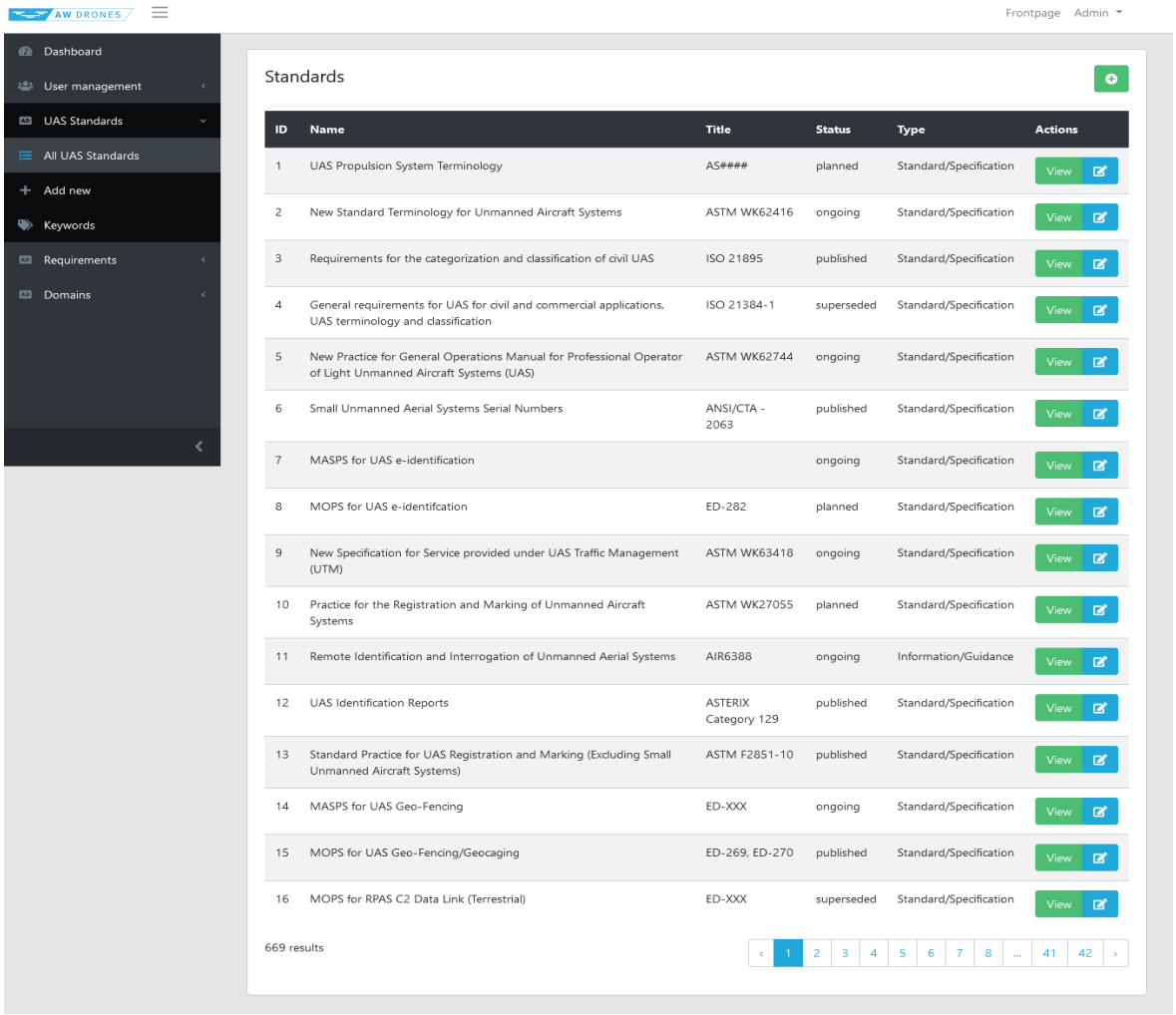

Figure 18. Backend standards management

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Administrators can add/edit new standards, view past revisions and rollback to a previous one:

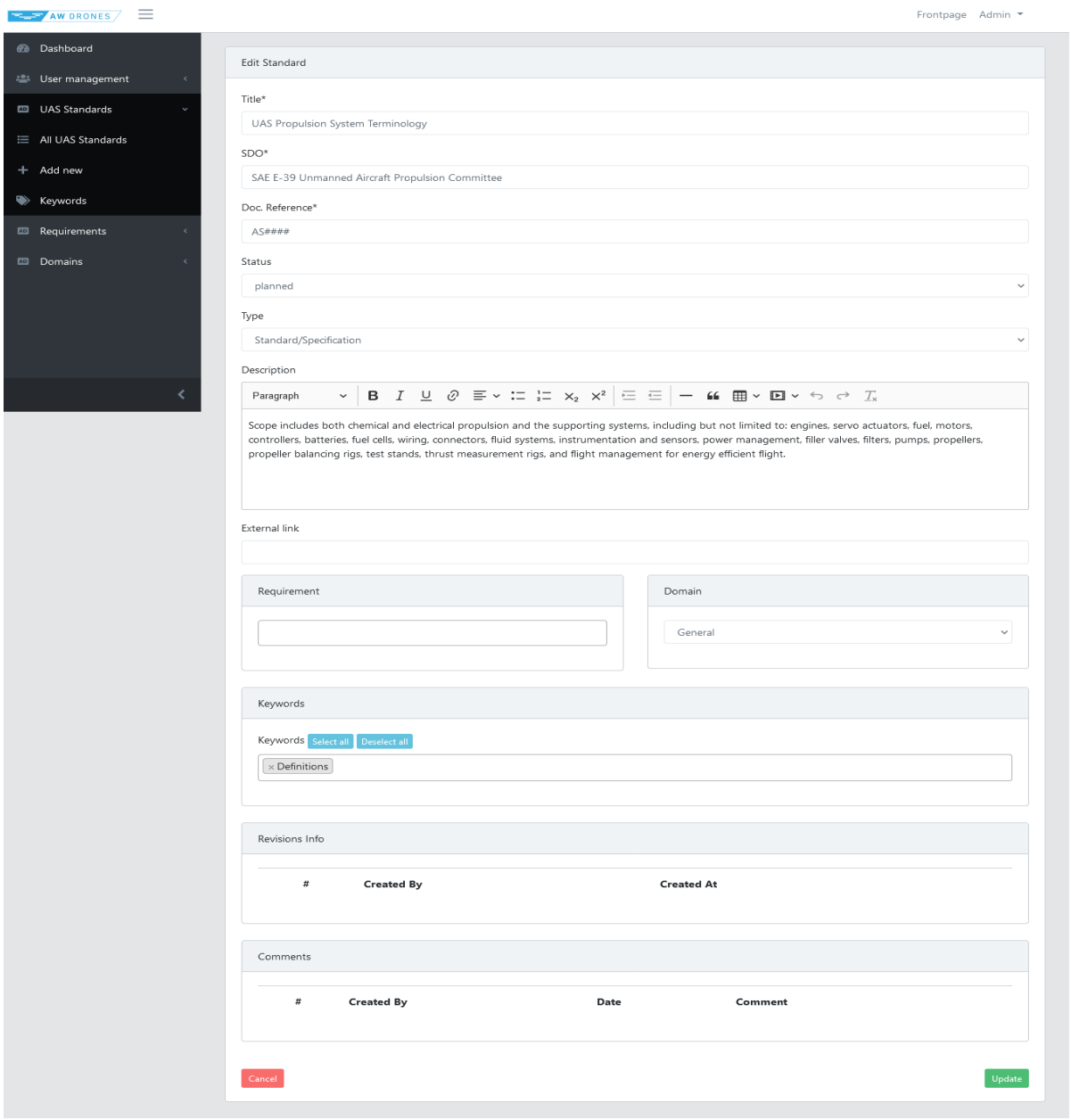

Figure 19. Backend add/edit standard form

Administrators can manage the requirements:

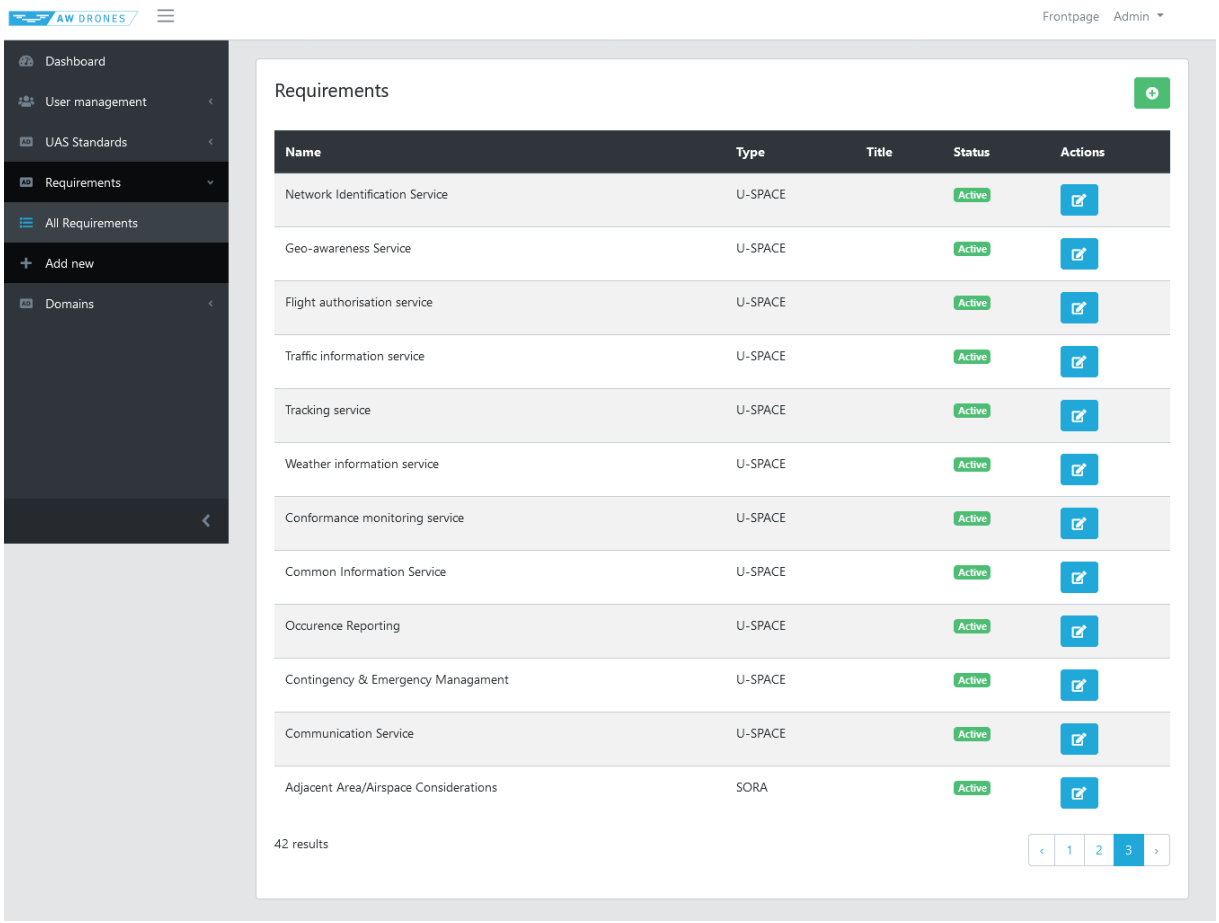

Figure 20. Backend requirements management

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Administrators can add/edit the requirements:

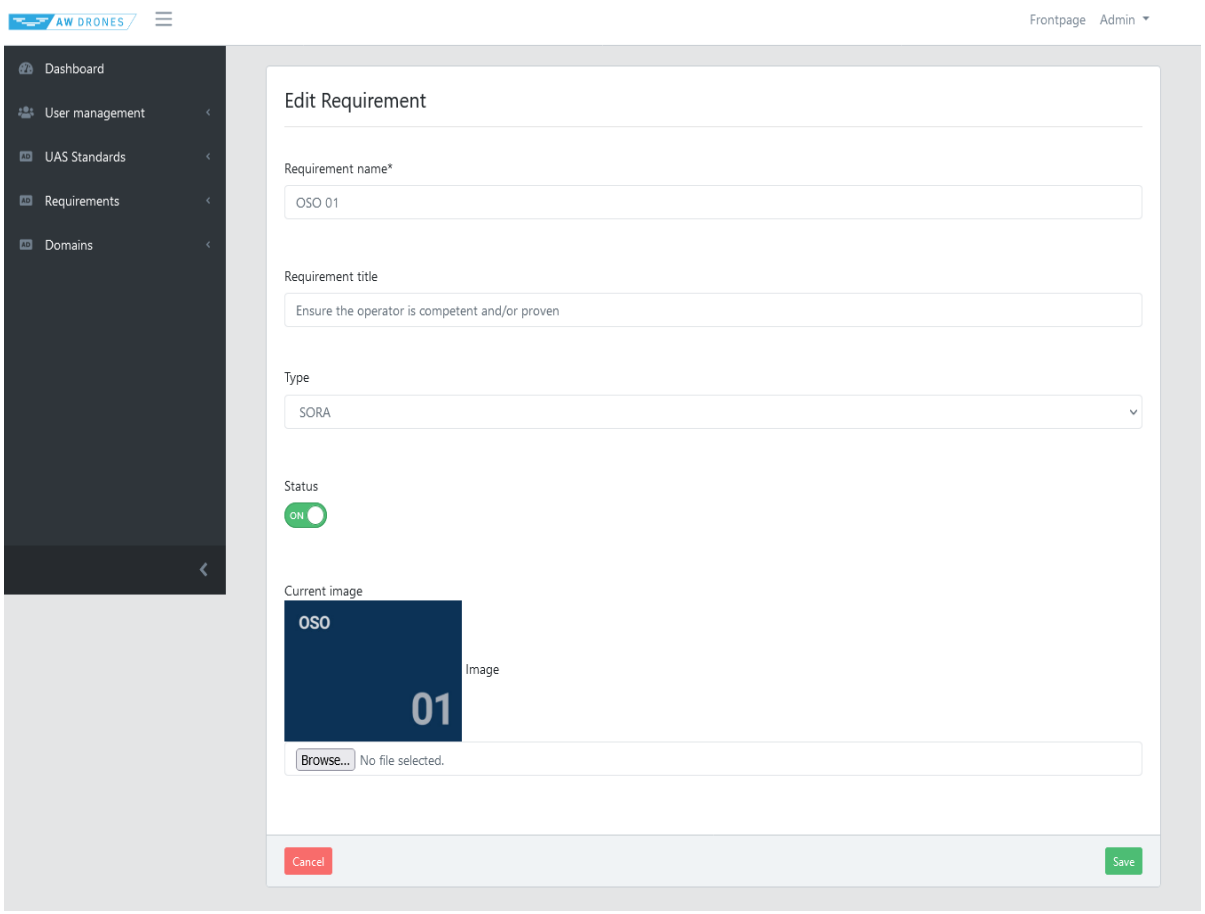

Figure 21. Backend add/edit requirement form

3 AW Drones standards User Manual

3.1 Quick Information (SORA & U-SPACE)

A user with no previous experience with UAS regulations may inquire about the main tab separation of the portal: **SORA** and **U-SPACE.** The following information is directed at providing a quick and simple overview of these two regulatory frameworks.

The **Specific Operations Risk Assessment** (SORA) was developed by JARUS (the Joint Authorities for Rulemaking on Unmanned Systems) in order to provide drone operators with a methodology for the risk assessment required to operate an Unmanned Aircraft System within the specific category.

Preparation of a drone operation will typically include a risk assessment using SORA. However, it is expected that many of current operations in the lower end of the specific category will be covered by standard scenarios, which already include the minimum set of requirements to be complied with, and will not therefore require the operator to perform the SORA process. This is where the regulation defined in U-SPACE comes in.

U-space is a set of new services relying on a high level of automation of functions and specific procedures designed to support safe, efficient, and secure access to airspace for large numbers of drones. This is to be used where SORA does not apply, namely drone operations in the very low level environment, covering many types of aerial activity, including leisure, remote infrastructure inspection, rural operations, flights in densely-populated and urban areas, and flights near protected sites, such as airports or nuclear power stations.

3.2 Drone Standards Portal – High-Level Architecture

Figure 2 displays a high-level architecture of the Drone Standards Information Portal. In the back-end, a database stores all the information presented on the portal. This information is presented to the user in stages, based on four main actions:

- Framework Selection: the user may select between SORA or U-SPACE. This selection is done through different tabs in the left top corner of the portal.

- Module Selection: within each regulatory framework there are several modules that the user may select from:

    - For the SORA framework:

        - SORA OSO 01

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        - SORA OSO 02
        - SORA OSO 04
        - SORA OSO 05
        - SORA OSO 06
        - SORA OSO 07
        - SORA OSO 08, 11, 14, 21
        - SORA OSO 09, 15, 22
        - SORA OSO 10, 12
        - SORA OSO 13
        - SORA OSO 16
        - SORA OSO 17
    - SORA OSO 18
    - SORA OSO 19
    - SORA OSO 20
    - SORA OSO 23
    - SORA OSO 24
    - SORA M1 S
    - SORA M1 T
    - SORA M2
    - SORA M3
    - SORA VLOS
    - SORA BVLOS
    - SORA Adjacent Area/Airspace

  - For the U-SPACE framework:

    - U-SPACE Network Identification Service
    - U-SPACE Geo-awareness Service
    - U-SPACE Flight authorisation service
    - U-SPACE Traffic information service
    - U-SPACE Tracking service
    - U-SPACE Weather information service
    - U-SPACE Conformance monitoring service
    - U-SPACE Common Information Service
    - U-SPACE Occurrence Reporting
    - U-SPACE Contingency & Emergency Management
    - U-SPACE Communication Service

- Standard Selection: after module selection, the user is presented with a list of the standards which cover the selected module. To help navigation through a potentially long list, the user may filter the standards by their properties, thus reducing the number of displayed standards.

- Standard Display: once the user selects a specific standard (with the “Read More” button), the portal will display all information available on that standard.

At any moment, the user may chose instead to directly search for a standard’s name or document number. The user will then be redirected to the single standard display page. The selected standard is presented alongside all the information available on it.

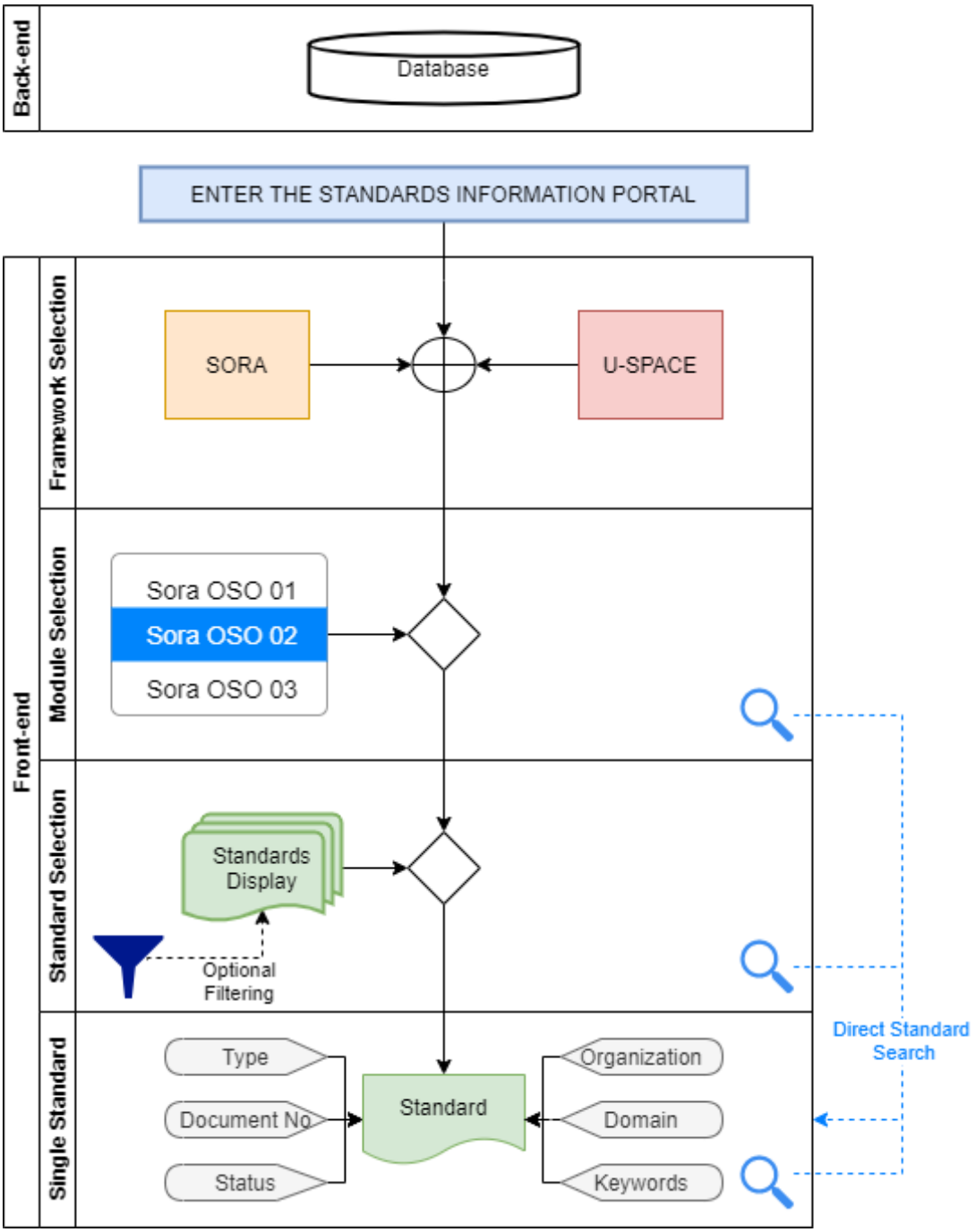

Figure 222: High-level architecture of the Drone Standards Information Portal.

3.3 User Actions

3.3.1 Framework Selection

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There are two main regulatory frameworks the user may select from: **SORA** and **U-SPACE**. These are presented through tabs in the top left of the portal, as shown in Figure 23. This selection will determine the modules presented next to the user.

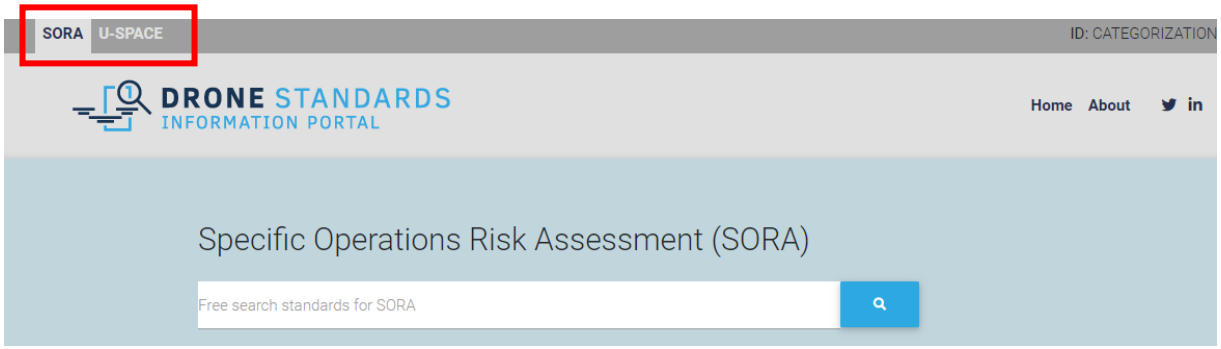

Figure 233: Main page of the Drones Standards Information where the main regulatory framework can be selected. In this example, the SORA framework is selected.

3.3.2 Module Selection

After selecting a framework, the user will be presented with the modules composing either SORA or U-SPACE framework. Examples are displayed in Figure 24 and Figure 25, respectively.

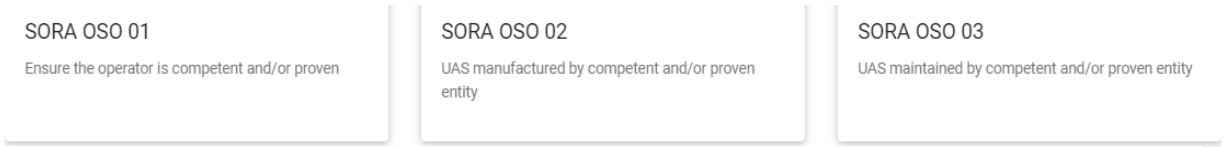

Figure 244: First modules presented once the SORA framework is selected.

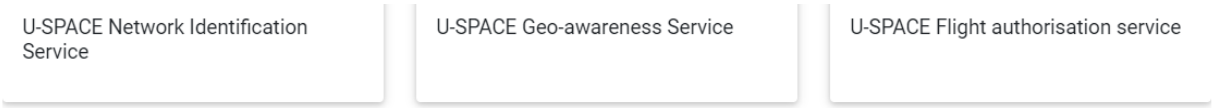

Figure 255: First modules presented once the U-SPACE framework is selected.

After selection of a module, the user will be redirected to a list of standards that cover the selected module. Figure 26 shows an example of the standards presented when SORA's OSO 01 is selected.

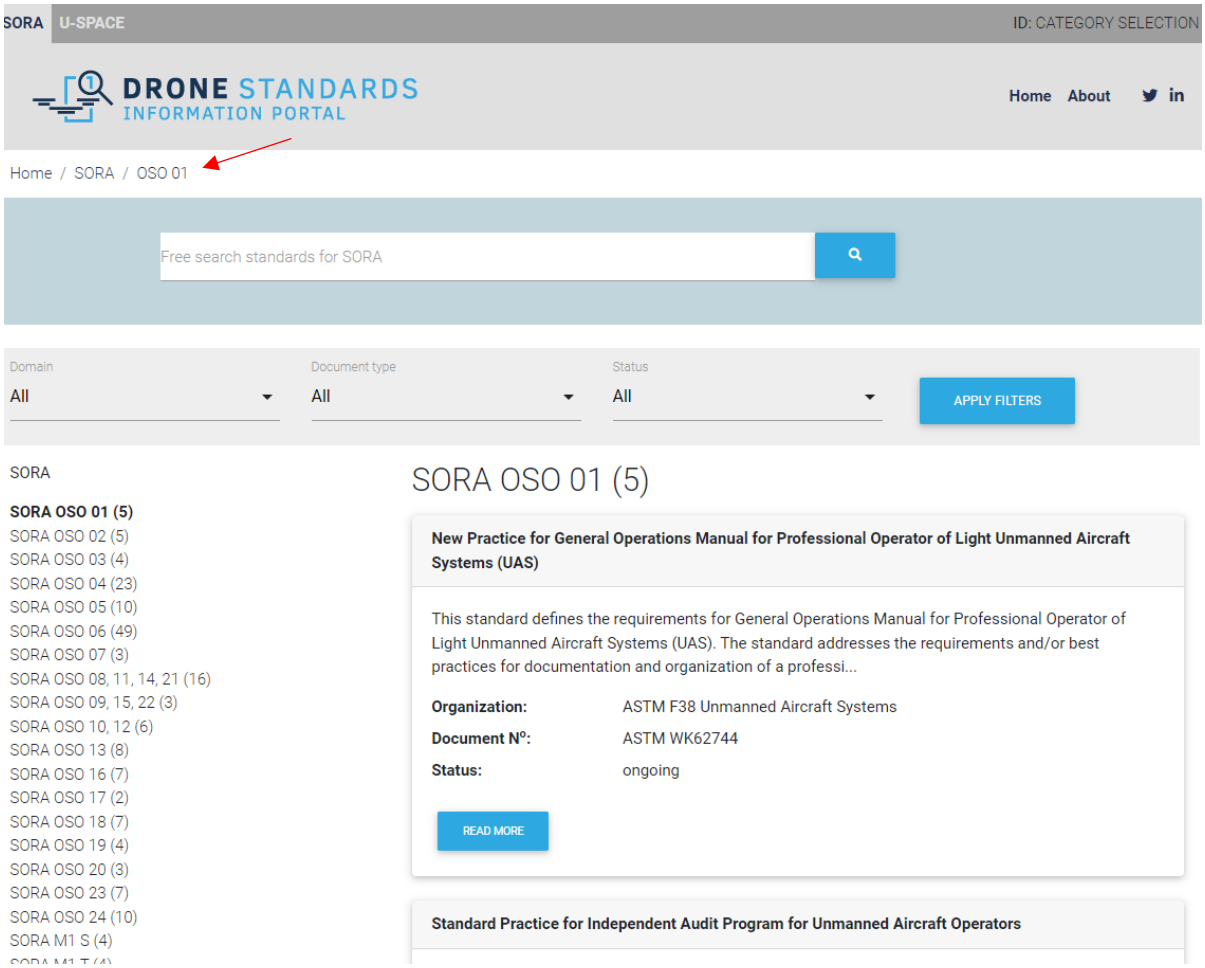

Figure 26: List of standards presented when module SORA OSO 01 is selected.

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Additionally, in order to select a module the user may:

- Clink upon a module listed left of the Standard Selection display, as previously shown in Figure 26.
- The user may see all the information available on a standard by pressing the “Read More” button. He/she is then shown all the information available on this standard, including indication of which modules the standard is applicable to. An example is shown below in Figure 27. These also serve as links that the user may click.

Figure 27: Example of the information displayed for each standard in the Drone Standards Information Portal.

3.3.3 Standard Selection

There are several ways available in the portal to gather information regarding a standard:

- The user may select a module. They will then be redirected to a list of standards that cover such module. By going through the list, the user may select any of the standards in order to see all the information available on it (see Figure 26).

- By using the search bar, as shown in Figure 28, the user may search for the name or document number of a standard. The list is automatically filled when a match is found.

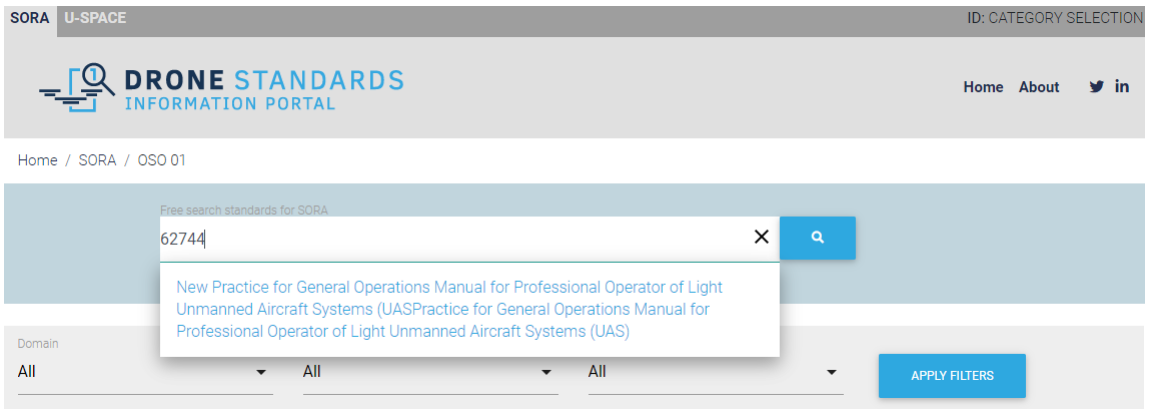

Figure 28: Example of a search for a standard through a document number.

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As displayed in Figure 29, the Drones Standards Information Portal has, for every standard, information regarding: type of document, organization, document number, domain, status, keywords, indication of which modules the standard applies to, and a description of content of the standard.

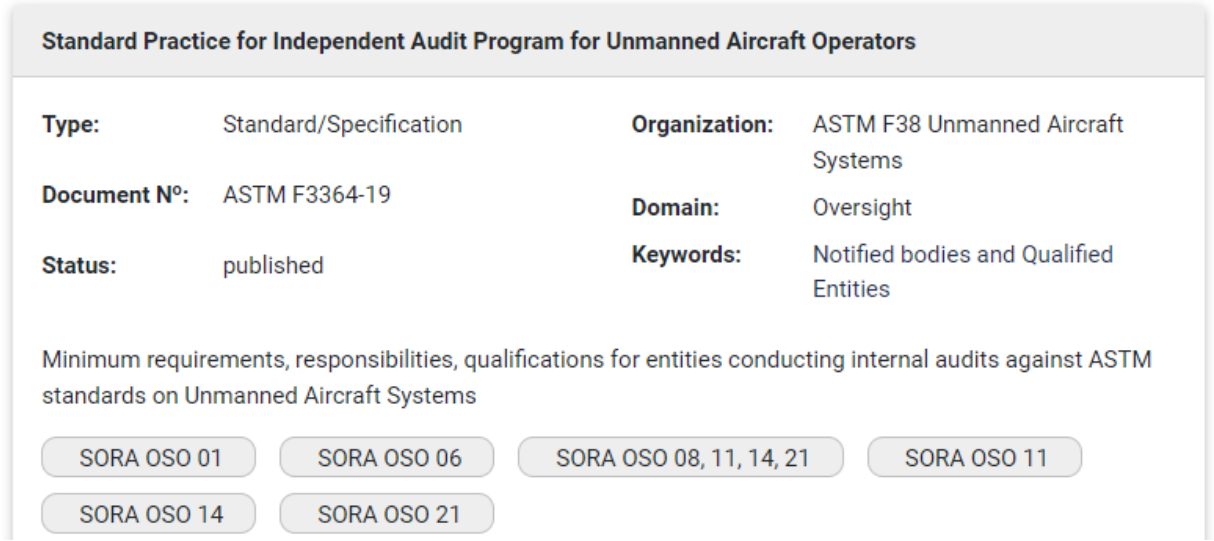

Figure 29: Example of the information displayed when standard ASTM F3364-19 is selected.

Additionally, the user may press any of the keywords in order to see all standards containing that same keyword. This allows the user to search for standards on a specific area. Figure 30

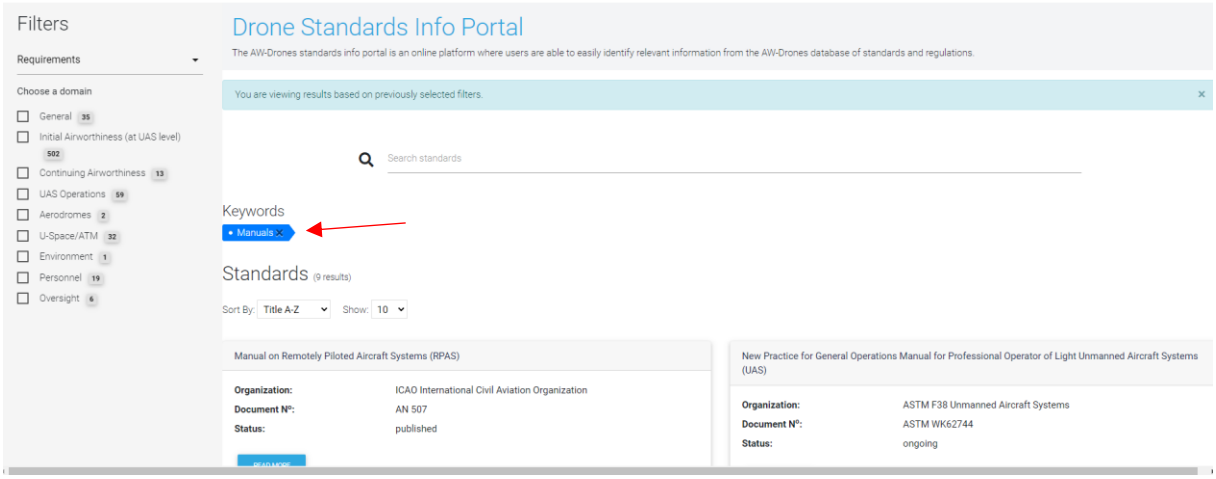

Figure 30 shows an example of the results of pressing keyword “Manuals” on the standard previously displayed in Figure 27.

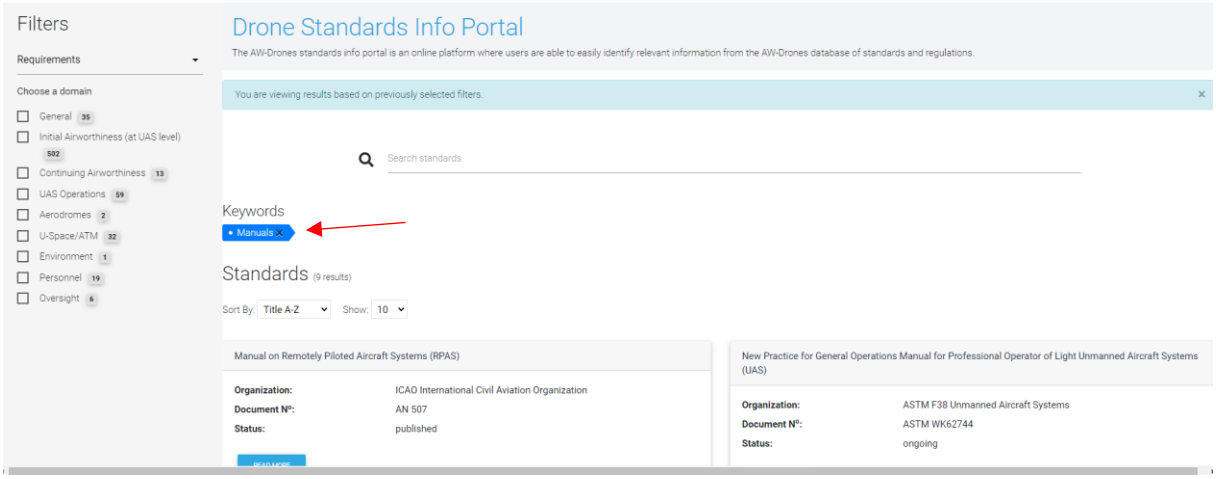

Figure 30: Search results shown when keyword "Manuals" is pressed.

3.3.4 Optional Filtering

The filter function shown in Figure 31 may be used to find specific standards based on their properties.

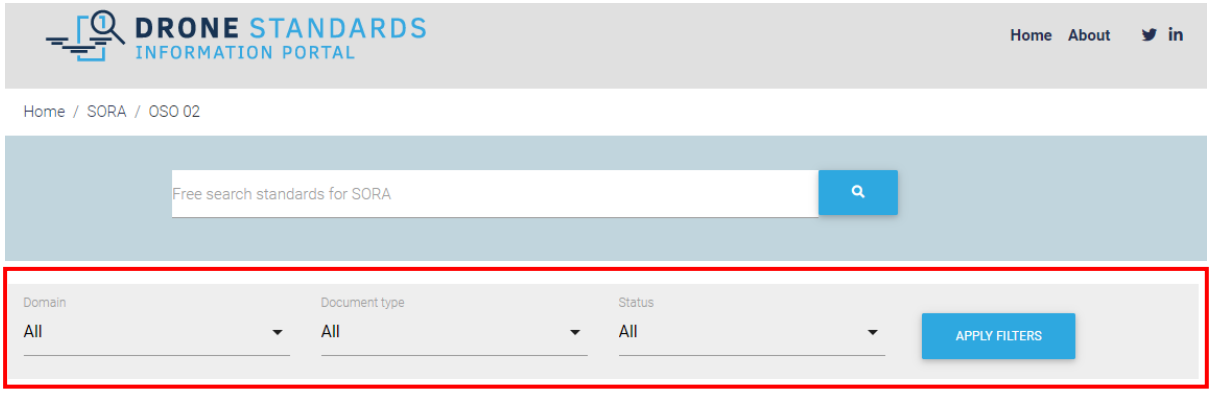

Figure 31: Filter function in the Drone Standard Information Portal.

The user may filter on:

- Domain:
  - General
  - Initial Airworthiness (at UAS level)
  - Contributing Airworthiness
  - UAS Operations'
  - Aerodromes

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- U-SPACE/ATM
- Environment
- Personnel
- Oversight

- Document Type:
  - Standard/Specification
  - Information/Guidance
  - Best Practices

- Status:
  - Planned
  - Ongoing
  - Published
  - Superseded

3.3.5 Quick Buttons

At any time, the user may return to the initial page of the Drone Standard Information portal by pressing quick button “Home” Figure 32 shows the positions of this button.

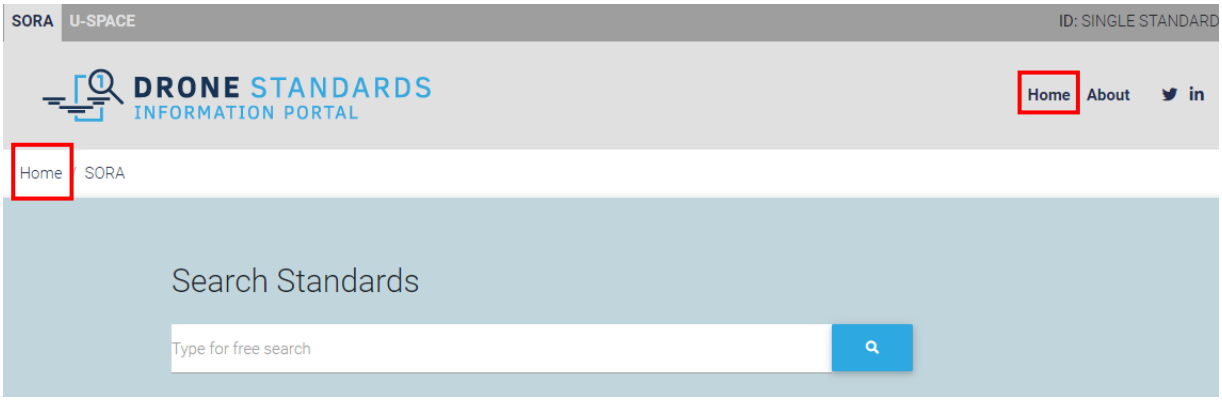

Figure 32: Quick button "Home" can be used to return to the main page of the Drone Standard Information portal at any moment.

Quick button “About” can be used any moment by the user in order to learn about the Drone Standard Information portal itself. The user will be redirected to the “About” page, as shown in Figure 33.

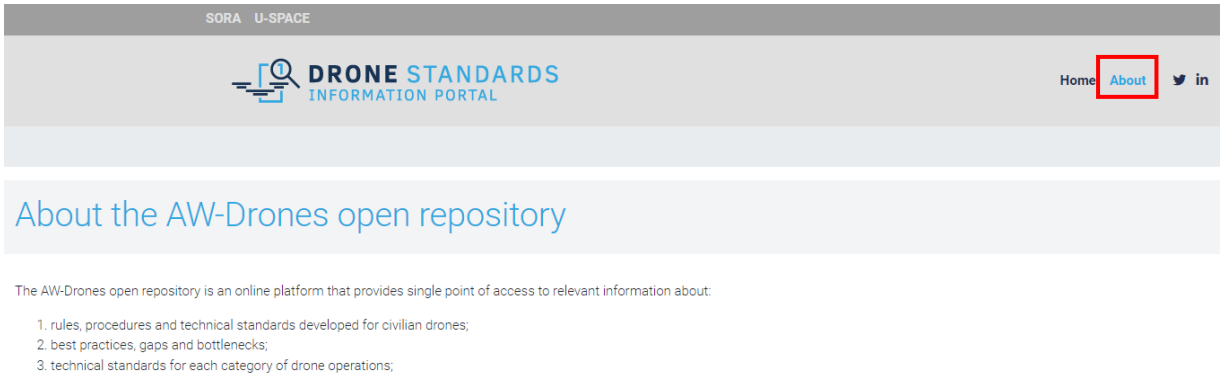

Figure 33.Figure 33: “About” page, where the user may learn more about Drone Standard Information portal.

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