



vgbe position paper

Designation of Power Supply Systems

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vgbe Position on the Designation of Power Supply Systems

Introduction

In recent years, the need to designate energy supply systems and their components unambiguously has even further increased. New technologies, optimised approval procedures, reduced planning, and construction times, limited human resources, requirements for database-based management systems as well as complex interface coordination due to increased work sharing require a logical, language-independent and simple designation system.

Different regulations for plant designation are currently on the market to meet these requirements:

- Power Plant Identification System KKS (**K**raftwerk-**K**ennzeichen**S**ystem) since 1978;
- **R**eference **D**esignation **S**ystem for **P**ower **P**lants **RDS-PP**[®], since 2006;
- **R**eference **D**esignation **S**ystem for **P**ower **S**upply **RDS-PS**, since 2022.

The variety of available designation schemes raises the following questions:

- Why do different designation systems exist?
- What are their main characteristics and differences between these systems?
- Which designation system is best suited for a particular power supply system?
- Is there a (legal) need to recode an existing designation to a more current system?
- Who can advise on the most suitable system?

vgbe energy e.V., the technical association of energy plant operators and the international competence centre for the generation and storage of electricity, heat, hydrogen and H₂-based sources of energy as well as sector coupling takes position on these topics in the following.

Development of plant designation



The **KKS** Power Plant Identification System was developed by planners and operators of the German power plant industry and published in 1978 as a national guideline of vgbe (former VGB Technischer Verband der Grosskraftwerksbetreiber e.V.). It has been used worldwide for decades in more than a thousand power plants and has become “acknowledged rule of technology.”

On international level, requirements for a designation system for industrial systems, plants, equipment and industrial products were developed by the “**International Electrotechnical Commission**” IEC as of 1988 and published for the first time in 1996 as the European basic standard **EN 61346-1**.

In parallel, sector-specific standards had been developed at national level since 1990, taking into account **KKS**. In 2007, the specific standard for power plant designation, **DIN 6779-10**, was published under substantial participation of vgbe members. It was transposed into international standardisation as **ISO/TS 16952-10** in 2008 and incorporated into the joint ISO and IEC series of standards as **ISO/TS 81346-10** in 2015.

On this normative basis, operators and manufacturers of energy supply systems have developed further application guidelines for various types of systems in the vgbe Working Group “Plant designation and documentation” to support practice-oriented plant designation. Together with the key parts for systems, technical equipment and product classes, these guidelines were published by vgbe as a complete work under the proprietary name **RDS-PP® Reference Designation System for Power Plants**.

RDS-PP® is the consequent advanced development of **KKS** with additional focus on new technologies of energy conversion, energy transmission and energy storage.



RDS-PP® is in line with international designation standards and is thus accepted and used worldwide. **ISO/TS 81346-10:2015** (*Industrial systems, installations and equipment and industrial products – Structuring principles and reference designation – Part 10: Power plants*) is still the normative basis for **RDS-PP®**.

In the course of periodical revision, the responsible ISO standardisation committee revised the specific standard **ISO/TS 81346-10** and published it as **ISO 81346-10** in August 2022 and since then promoted it as **RDS-PS**. The result of this revision is a completely new standard that has no correspondence whatsoever with the original edition.

Characteristics of the different designation systems

The main characteristics of the **KKS** and **RDS-PP®** designation systems are as follows:

- The principles of plant structuring follow the international basic standard IEC 81346;
- all systems and technologies of the energy supply can be clearly and unambiguously designated;
- the designator structure is identical for all disciplines, e.g. mechanical engineering, civil engineering, electrical engineering and control technology;
- the same designation rules can be applied for design, construction and operation;



- Signals, terminals and documents can be clearly designated;
- Cost centres, work orders, damage statistics can be designated by using **KKS** or **RDS-PP®** codes;
- language-independent codes are applied.

KKS includes key parts (compilation of all codes) for functional systems, aggregates and components.

RDS-PP® comprises key parts for systems, technical equipment, and product classes.

The new designation system **RDS-PS** is being provided by ISO and has the following main characteristics:

- A large number of application possibilities and any designator structure is allowed;
- system classes are provided according to the principle of inherent function without specification of boundaries;
- up to 8 tables from 4 different sector-specific and basic standards are required for the creation and interpretation of designators;
- for the designation of structures for power supply systems, the sector-specific standard for civil engineering ISO 81346-12 (RDS-CW) shall also be applied.

The main differences between the various designation systems are compared below:

	KKS	RDS-PP®	RDS-PS
Application guidelines	Mechanical, civil, electrical engineering and control technology	Power plants, general, hydro-, wind power, photovoltaic, combustion & gas engines, power to gas	Currently not available
Number of key tables for the creation and interpretation of the designators	3	2	Up to 8
Number of designation systems in one project	1	1	2 (RDS-PS and RDS-CW*)
Fixed designator structure	Yes	Yes	No
Representation of system boundaries	Yes	Yes	No
Consideration of systems by task and purpose	Yes	Yes	No, classification according to inherent function of the systems
Rules for numeral parts	Yes	Yes	No
Conformance to database applications	Yes	Yes	No, by arbitrary designator structure

* RDS-CW Reference Designation System for Civil Works

Selection of a designation system

In principle, there is no absolutely true or false designation system. In principle, all presented systems are suitable to clearly designate an energy supply system.

According to current knowledge, there is also no obligation to switch from one designation system to another.

Therefore, it has to be checked individually how to optimally designate an installation. These criteria can be:

- Will the plant be built on a new “greenfield” site or integrated into an existing park?
- Is there already an operation management system that will be used to run the new plant?
- Which designation systems have already been implemented in the IT systems?
- What knowledge and experience in plant designation do operating and maintenance personnel have?

Based on these criteria, the following recommendations can be made:

- The **KKS** or **RDS-PP**[®] designation systems can be used equally without restriction. The support provided by vgbe for these systems (provision of application guidelines, training, consulting, ongoing maintenance and further development) is ensured. For **RDS-PS**, vgbe is currently not planning any similar support.
- As far as possible, different systems should not be established at one site, as this poses risk of safety-relevant misinterpretation by operating personnel.
- Extensions to existing plants should use the same designation as the existing plant.
- Compared to **KKS**, **RDS-PP**[®] reflects the state of the art with extended application options such as designation of plant sites and dynamic processes. In addition, **RDS-PP**[®] is based on an internationally recognised standard.

- New plants, especially in the wind or PV sector, but also plants for new technologies such as power-to-gas should therefore be designated with **RDS-PP®** if permitted by the above-mentioned limiting conditions. Designation with **KKS** is also possible, but may require some more effort.
- **RDS-PS** is currently not recommended by vgbe due to its impractical usability, the need for extensive project-specific specifications, and the unavailability of more extensive application support in power supply projects.

About vgbe energy e.V.

vgbe energy e.V. is the international technical association of energy plant operators. Its members are companies that operate plants for power, heat and cooling generation, energy storage and sector coupling worldwide. Currently vgbe comprises 411 member companies located in 29 countries. The present installed plant capacity of vgbe member companies amounts of about 300,000 MW.

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