

# **NOVA INDUSTRIAL S.A.**

**Our know-how, for your safety!**

**Over 20 years  
of experience**

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**ISO 9001, ISO 14001, ISO 18001, ISO 27001**

# SUMMARY

- **WHO IS NOVA INDUSTRIAL SA?**
- **SERVICES**
- **PRODUCTS**
- **SOFTWARE**
- **R&D ACTIVITY**
- **KNOW – HOW**
- **AFFILIATIONS**

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# WHO IS NOVA INDUSTRIAL?

**NOVA INDUSTRIAL S.A.** is one of the most well-known and experienced power sector consultancy companies, with 100% Romanian private capital, operating successfully on the Romanian market since 1996.

**NOVA INDUSTRIAL S.A.** aims to meet the demands of the **power sector** through:

- **consultancy services,**
- **studies, research and development activities, engineering,**
- **designing, manufacturing, delivering and maintenance of high technical level products, specific to the power field.**

**Hundreds individual contracts in the power sector!**



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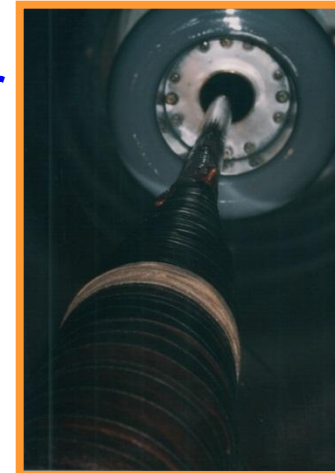
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# WHO IS NOVA INDUSTRIAL?

Among the key strengths of **NOVA INDUSTRIAL S.A.**, we may mention:

- a powerful team of **experts with extensive experience** in the **power field**, well-known in the country and abroad;
- a large database, built up in **over 40 years of activity** in the power field;
- a special **endowment of high-tech equipment**, for maintenance operations, testing, monitoring and diagnosis of electrical installations;
- the **capacity of research, technological innovation and development**, recognized through patents and medals;
- the opening to the **latest international discoveries** in the field.

**Technical expertise & refurbishing  
offered to hundreds of large power  
transformers and primary  
equipment of 110-750 kV!**



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# WHO IS NOVA INDUSTRIAL?

The company's capacity is ensured by its specialist's professionalism (**scientific researchers, academics, engineers and technicians**), many of them well appreciated for their extensive professional experience in the power field, both at national and international level (members of different **CIGRE, IEEE** and **CEI** committees).

**Among our specialists there are experts who have contributed to the development and modernization of the national power system**, together with young enthusiasts, eager to assert themselves in the technical and scientific field!



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# WHO IS NOVA INDUSTRIAL?

NOVA INDUSTRIAL S.A. is:

- **certified by ANRE** (The Romanian Energy Regulatory Authority),
- **licensed by CNCAN** (The National Commission for the Nuclear Activities Control),
- **certified as agreed supplier** of services and products by **CNTEE** **TRANSELECTRICA S.A.**, **NUCLEARELECTRICA S.A.**, **SMART S.A.**, etc.



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NOVA INDUSTRIAL S.A. is CNTEE TRANSELECTRICA  
official consultant for the period 2015 - 2018  
(consecutive after period 2011-2014)  
for "power stations"!

# WHO IS NOVA INDUSTRIAL?

## Key Clients & Partners:

- CNTEE Transelectrica S.A.;
- Ministerul Educatiei, Cercetarii si Tineretului;
- SN Nuclearelectrica S.A.;
- Hidroelectrica S.A.;
- Electrica S.A.;
- ENEL Romania S.A.;
- Smart S.A.;
- Elcomex IEA S.A.;
- etc.



MINISTERUL COMUNICAȚIILOR  
ȘI PENTRU SOCIETATEA INFORMAȚIONALĂ

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# WHO IS NOVA INDUSTRIAL?

**NOVA INDUSTRIAL S.A. has implemented, is certified and maintains an Integrated Quality Management System (*Quality - Environment - Occupational Health and Safety*, plus *Information Security Management System*), according to **ISO 9001/2008, ISO 14001/2004, OHSAS 18001/2007 / ISO 45001/2018 and ISO 27001/2013.****

**NOVA INDUSTRIAL S.A. has implemented **quality management system** in accordance with **Law 111/1996** and **nuclear CNCAN norms**.**



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# SERVICES

**NOVA INDUSTRIAL S.A.** provides consultancy services in the **high voltage substations field and related electrical equipment**, through:

- analysis of technical solutions for all areas, activities and topics that are the object of operation/exploitation, maintenance and investments works made in substations;
- expertise of high and very high voltage substations;
- technical expertise for grounding systems;
- measurement of the electromagnetic field strength and distribution in the power installations, etc.;

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for “power substations”!**



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# SERVICES

In the field of power stations **primary equipment** (power transformers, shunt reactors, instrument transformers, disconnectors, surge arresters, circuit breakers, insulators, etc.), NOVA INDUSTRIAL S.A. provides dedicated services, such as:

- expertise of the technical condition through specific measurements, tests, diagnosis (**partial discharges, frequency response analysis, low voltage impulses, polarization and depolarization current, recovery voltage measurement, etc.**), on site and in laboratory and related to the history of the analyzed equipment;
- evaluation and interpretation of the analysis, tests and measurements performed on electrical installations and equipment by third parties; elaboration of the technical reports of evaluation;



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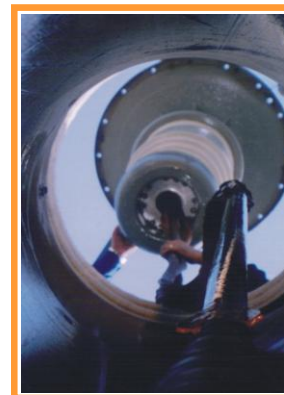
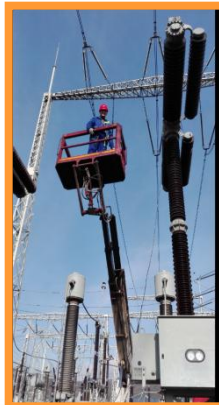
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# SERVICES

In the field of power stations **primary equipment** NOVA INDUSTRIAL S.A. provides dedicated services, such as *[con't]*:

- standard tests (according to Romanian standards or maintenance guidelines / norms) or special tests, in substations or in the high voltage laboratories;
- elaboration of the technical documentation and technical assistance for insulation refurbishing works, for medium / high power transformers and shunt reactors in operation (**experience in onsite refurbishing of over 200 power transformers and shunt reactors of 110-750 kV rated voltage**);
- preparing the auction documents or the evaluation of offers;
- technical assistance for acquisition and reception of the power equipment from suppliers and manufacturers;



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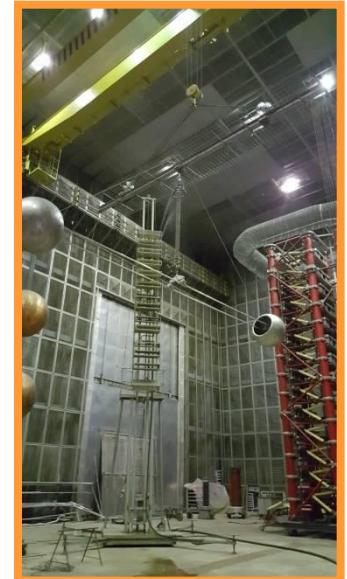
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# SERVICES

In the field of **primary equipment**, NOVA INDUSTRIAL S.A. provides **dedicated services, such as** *[con't]*:

- tests and technical assistance for putting into operation of high voltage electrical equipment;
- elaboration of technical specifications for the acquisition of the electrical equipment and installations;
- elaboration of internal technical norms, procedures and operation/exploitation norms;
- technical assistance and/or performing services for repairing or upgrading the power equipment of SEN (National Power System).



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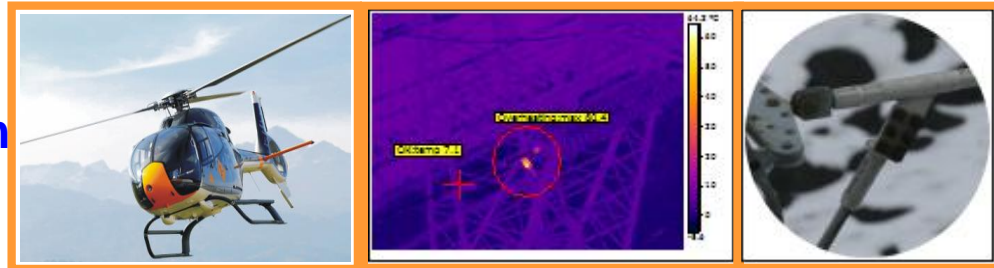


# SERVICES

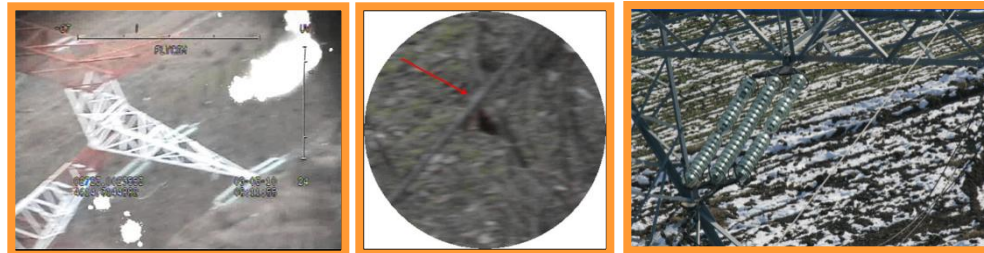
**NOVA INDUSTRIAL S.A.** provides **services** in field of **high voltage overhead power lines** through *[cont'd]*:

- **airborne multi-spectral inspection** (UV, IR and video), by helicopter, of the 110 – 750 kV overhead power lines and power stations - partner **FLYCOM Slovenia**;
- **airborne laser scanning and data analysis** of medium and high voltage overhead power lines or other targeted systems partner **FLYCOM Slovenia**.

There were carried out aerial inspections for over 3200 km of 220 and 750 kV overhead power lines operated by **CNTEE Transelectrica SA**



IR inspection



UV inspection

Visual inspection

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A constant concern of our team of specialists is to ensure **safety in operation and extension of the remaining life of the high voltage equipment and installations, such as:**

• **NOVA EMCSIT** a complex systems for on-line monitoring and diagnosis of all 400 kV and 110 kV substation electrical equipment that can be used independently or within an integrated **Smart Grids** system for:

- reducing catastrophic failures and collateral damage;
- improving the reliability/availability and security in operating of high voltage equipment;
- reducing maintenance costs;
- improving the effectiveness of maintenance;
- deferring equipment replacement (extending their life);
- reducing the risk for the human health and environment, etc.

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# PRODUCTS

**NOVA EMCSIT monitoring system discovers (identifies) the modification in the internal state of the primary equipment in due time minimizing the risk of major outages accompanied or not by explosion, fire or other dangerous effects.**



**250/250/80 MVA 400/121/20 kV transformer exploded and fire**



**400 kV bushing exploded and 100 MVA 400 kV shunt reactor fire**



**400 kV, 2000 A, SF6 circuit breaker exploded**



**Disconnector opened under load**



**123 kV current transformer exploded**



**220 kV voltage transformer exploded**



**110 kV Surge arrester damage**

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# INTRODUCTION

**NOVA EMCSIT monitoring system can avoid producing important damages that affect the functioning of the system and bring massive damage to energy companies and consumers.**



**500/345/34,5 kV  
substation (2003)  
USA**



**330/110 kV substation (2016)  
Rusia**



**Substations completely destroyed as a result of failure of one of the power transformers**

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**NOVA EMCSIT integrated system for complex on-line monitoring and diagnosis of high voltage substations**, consist of:

• **NOVA TRAFOMON - complex system for on-line monitoring of power transformers and shunt reactors**, which includes:

- ✓ **NOVA IED** intelligent electronic device for on-line monitoring and diagnosis;
- ✓ **NOVA SMT** equipment for on-line monitoring of high voltage bushings;
- ✓ **NOVA EFBR** equipment for on-line monitoring of cooling system;
- ✓ **NOVA CBR** equipment for controlling operation of cooling system;
- ✓ **NOVA CRS** equipment for on-line monitoring of transformer on-load tap changer;
- ✓ **NOVA M** equipment for on-line monitoring of oil conservator membrane condition;
- ✓ **NOVA DISTURBANCE**, for on-line monitoring of disturbances and input/output power parameters;
- ✓ Equipment for on-line monitoring of dissolved gas and moisture in transformer oil;
- ✓ Equipment for on-line monitoring of partial discharges;

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**NOVA EMCSIT integrated system for complex on-line monitoring and diagnosis of high voltage substations**, consist of [cont'd]:

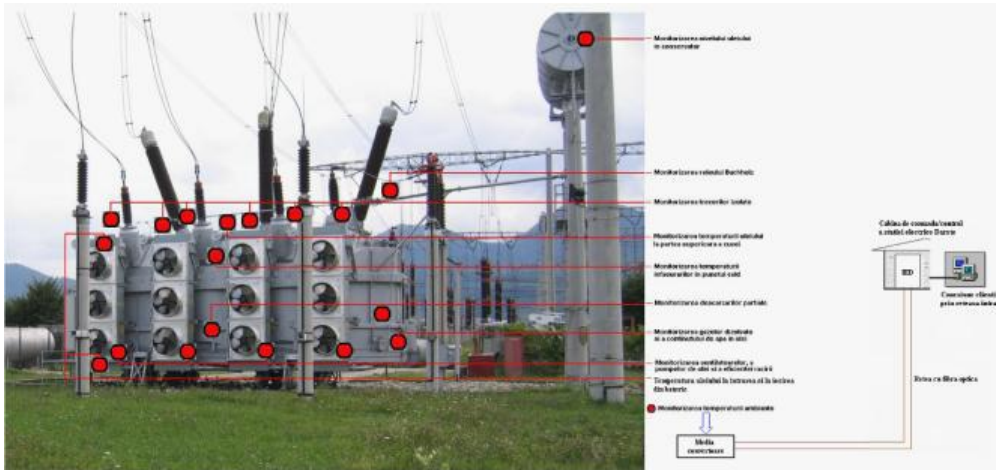
- **NOVA complex system for on-line monitoring of high voltage substation apparatus**, consist of:
  - ✓ **NOVA EMCSIT I** equipment for on-line monitoring of high voltage circuit breakers;
  - ✓ **NOVA EMCSIT S** equipment for on-line monitoring of high voltage disconnectors;
  - ✓ **NOVA EMCSIT TT** equipment for on-line monitoring of voltage transformers;
  - ✓ **NOVA EMCSIT TC** equipment for on-line monitoring of power transformers;
  - ✓ **NOVA EMCSIT D** equipment for on-line monitoring of high voltage surge arresters;
- **NOVA VIDEO system for on-line video monitoring of substation primary equipment;**
- **NOVA sensors, transducers, etc.**

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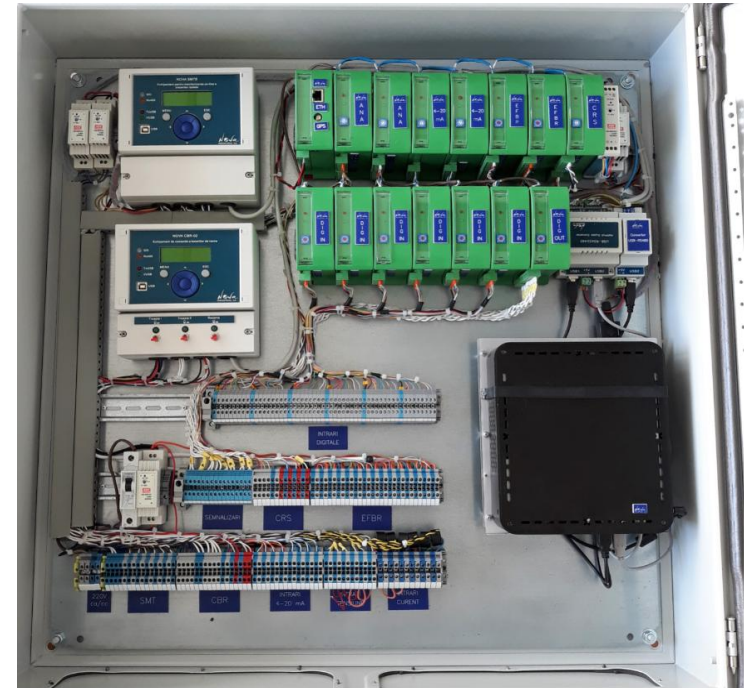
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## NOVA TRAFOMON - complex system for on-line monitoring of power transformers and shunt reactors



## NOVA TRAFOMON 5



**IED TRAFOMON 5**  
- in command room;  
- on transformer tank



## NOVA DISTURBANCE

## NOVA SMT, CRS, EFBR, CBR



NOVA M

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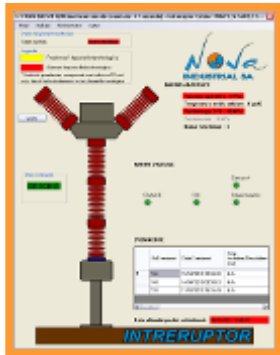
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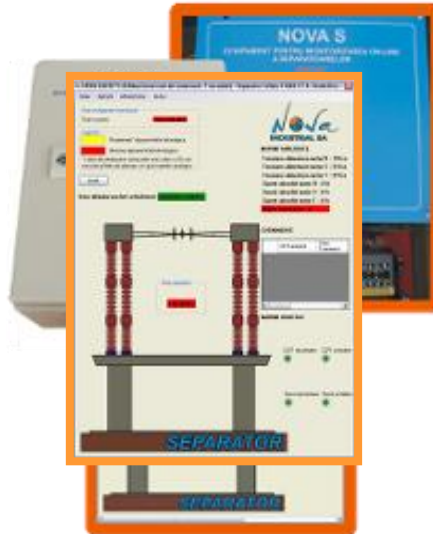


# PRODUCTS

**NOVA EMCSIT complex system for on-line monitoring of high voltage substation apparatus**



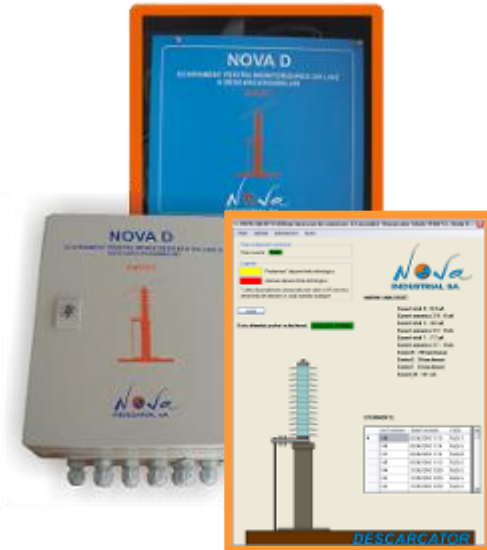
**NOVA EMCSIT - I**



**NOVA EMCSIT - S**



**NOVA EMCSIT - TC/TT**



**NOVA EMCSIT D**



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# PRODUCTS

**NOVA VIDEO system for on-line video monitoring of substation primary equipment**



**NOVA VIDEO cameras**



**400/110 kV Darste substation  
on-line video monitoring**



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# PRODUCTS

- NOVA OHLM system for on-line monitoring of high voltage overhead power lines (OHL's)

The NOVA OHLM is an original and intelligent system for OHL on-line monitoring, able to detect and measure in real time the operational parameters and technical conditions of the power lines, faults and disruptions appeared in the functioning of the power lines due to various causes



Collapse in 2014 of a 220 kV OHL due to wind conditions (exceptional speed and gust)



A 400 kV tower damaged in December 2014 on a 400 kV OHL due to an exceptional snow and ice deposit



Steel towers damaged in 2014 on a 400 kV OHL due to tower anchors cutting by metal thieves

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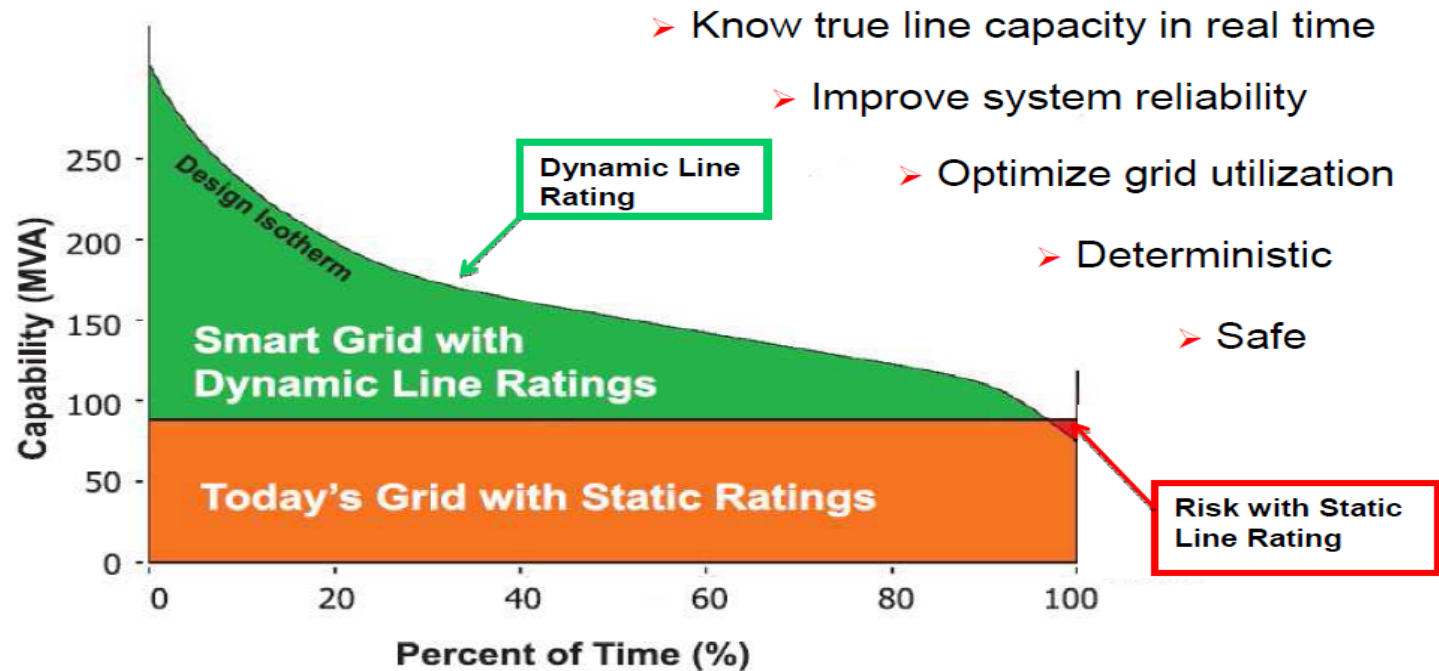
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# PRODUCTS

- NOVA OHLM system for online monitoring of high voltage overhead power lines (OHL's)

The NOVA OHLM on-line monitoring system allows to maximize the grid efficiency using Dynamic Load line Rating instead of Static Line Rating



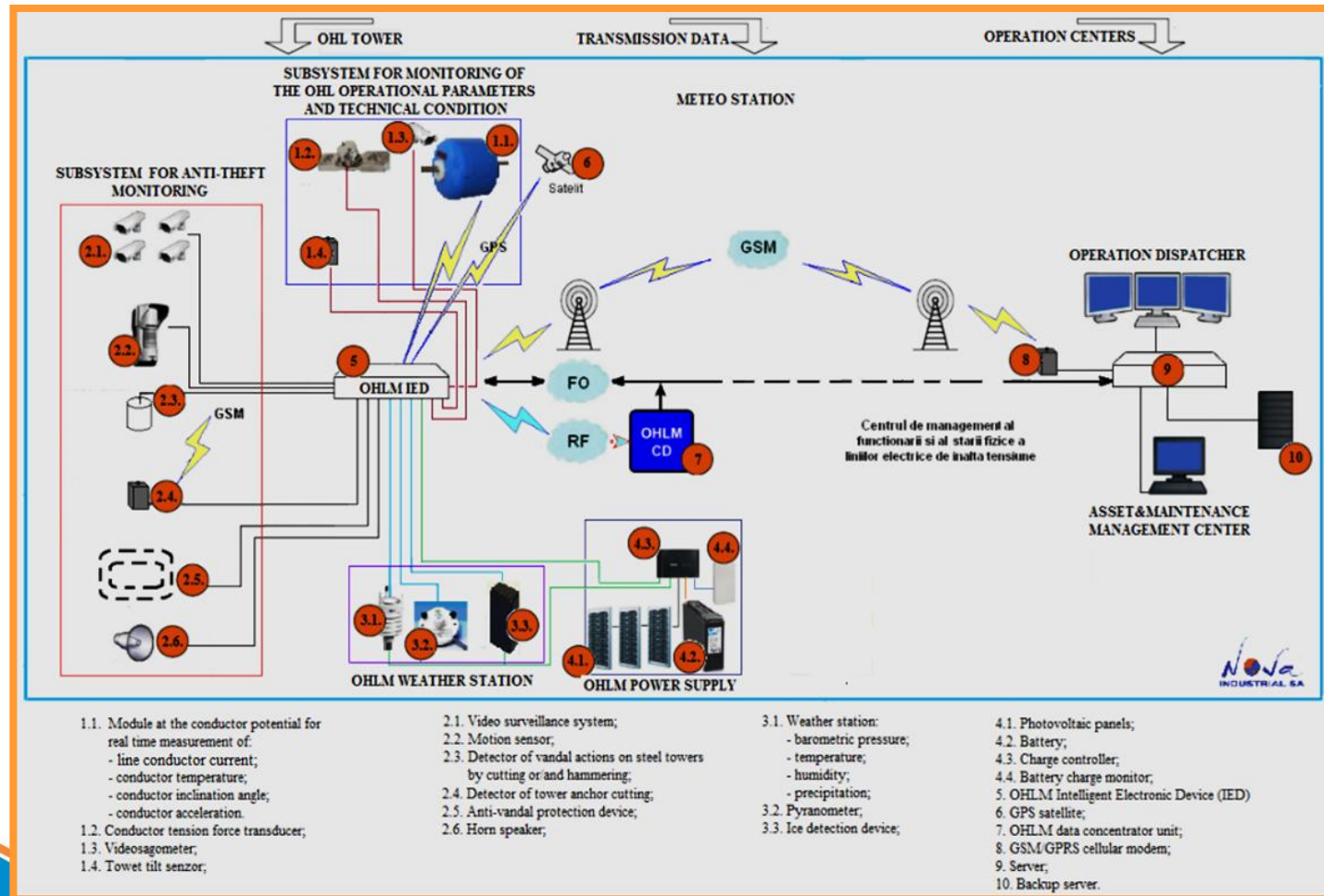
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# PRODUCTS

## NOVA OHLM complex system for on-line monitoring of high voltage overhead power lines (OHL's)



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## NOVA OHLM system for on-line monitoring of high voltage overhead power lines (OHL's)

**OHLM system** realizes the on-line monitoring of OHL's and is composed of:

- a subsystem for monitoring the operational parameters and technical condition of the OHL's;
- a subsystem for monitoring the weather parameters;
- a subsystem for monitoring the vandalism actions on the steel tower and its anchors (if the tower has anchors);
- an intelligent electronic device for acquisition / processing / storage and remote data transmission;
- an independent power supply source.

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## NOVA OHLM system for on-line monitoring of high voltage overhead power lines (OHL's)

- **The OHL operating parameters on-line monitoring:**
  - current through the line conductor;
  - conductor temperature;
  - conductor sag;
  - conductor oscillations (conductor galloping) ;
  - conductor tension;
  - ice deposition on conductor;
  - tower inclination.
- **The weather parameters on-line monitoring:**
  - wind direction and speed;
  - air temperature;
  - solar radiation.

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## NOVA OHLM system for on-line monitoring of high voltage overhead power lines (OHL's)

- **The accumulation of ice/hoar-frost on line conductors on-line monitoring, by:**
  - software processing of the weather data;
  - ice detection;
  - conductor tension measurement;
  - video images.
- **The vandalism actions on-line monitoring on metal towers and anchors (detection of the unauthorized persons, by:**
  - detection of cutting and hitting metal bars of tower structure;
  - cutting of at least one anchor of the tower.

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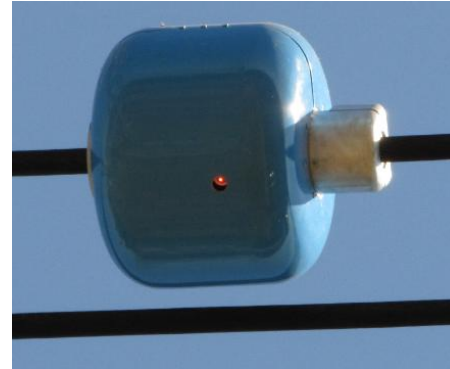
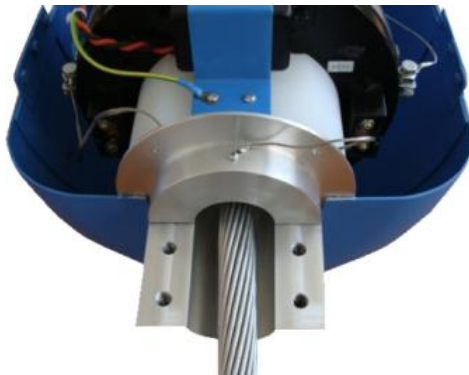
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# Components of NOVA OHLM system for on-line monitoring of high voltage overhead power lines (OHL's)



OHLM<sub>HV</sub> module on OHL conductor



OHLM A detector of tower anchor cutting



OHLM ST detector of cutting or hitting tower metal bars

OHLM<sub>HV</sub> mounting on 400 kV Bucharest South – Pelicanu overhead power line conductor



OHLM IED



OHLM during of the tests in the high voltage laboratory

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# PRODUCTS

Consistent with the strategy of transition from preventive to predictive maintenance, NOVA INDUSTRIAL S.A. developed **high-tech products**, such as:

- **NOVA PDC - RVM** - apparatus for the diagnosis of the insulation condition of the power transformers in operation, by measuring the polarization / depolarization currents (PDC method) and respectively, by measuring the recovery voltage (RVM method) - **exported product in Finland;**
- **NOVA - ARF / IJT** - installations that detect the winding deterioration or deformation, resulted from electro-dynamic stresses of the winding of power transformers in operation, using the frequency response analysis (ARF method) and low voltage impulses test (LVI method);
- **NOVA TIME TESTING NT3** - digital millisecond-meter used to measure the operation time for the circuit breakers, relays, etc. - **exported product in Germany;**



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# PRODUCTS

- **N - SAT** - apparatus for verifying the surge arresters and the surge arresters' counters;
- **AS - 01** - apparatus for testing of surge arresters;
- **Xb & Za** - additives that increase the quality of the mineral insulating oil from the transformer and also improve the winding insulation resistance for the new power transformers or the ones already in operation,
- etc.

**For example, Xb additive added in transformer oil, generates a 3-10 times increasing in the insulation resistance of transformer windings, for a long time, without adversely affecting other characteristics of oil or solid insulation!**

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# SOFTWARE

**NOVA INDUSTRIAL S.A.** developed and implemented specific application software for the power system (**on-line and off-line monitoring systems, expert systems, databases**, etc.), dedicated to the **maintenance activity, active management and the safety in operation of the primary equipment and high voltage power lines**, such as:

- **NOVA TRAFOMON** for real time, on-line monitoring and diagnosis of power transformers and shunt reactors;
- **NOVA EMCSIT - I, S, TC / TT, D** - range of software systems for the on-line monitoring of circuit breakers (I), disconnectors (S), current transformers (TC)/voltage transformers (TT), surge arresters (D);
- **NOVA EMCSIT substation dynamic schema** - software for the real-time tracking of the momentary technical condition of the primary equipment in a high voltage station, based on data provided by the monitoring equipment NOVA EMCSIT - I, S, TC / TT, D and specific diagnosis software;

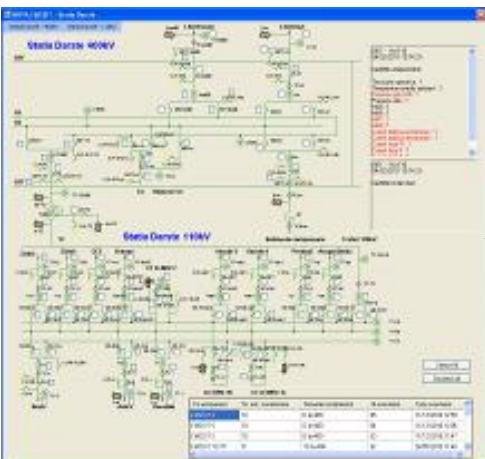
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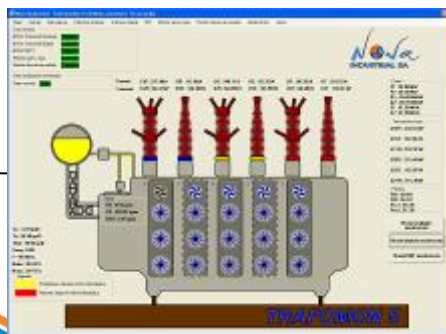
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# SOFTWARE

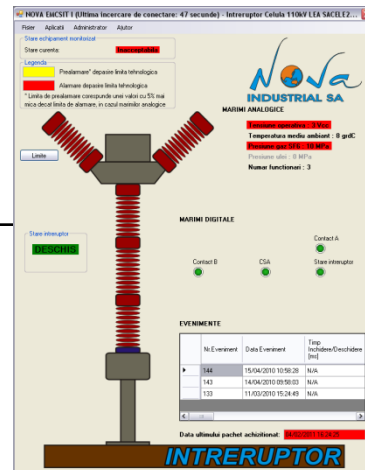
## of NOVA EMCSIT system for complex on-line monitoring of high voltage substations



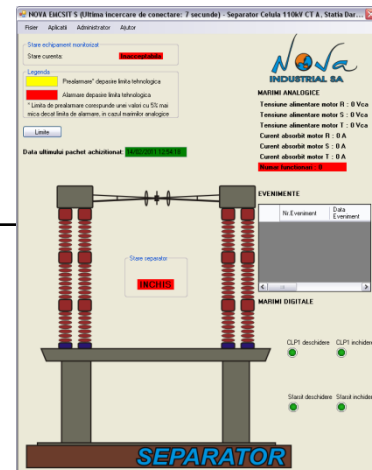
**NOVA EMCSIT -  
substation  
dynamic schema**



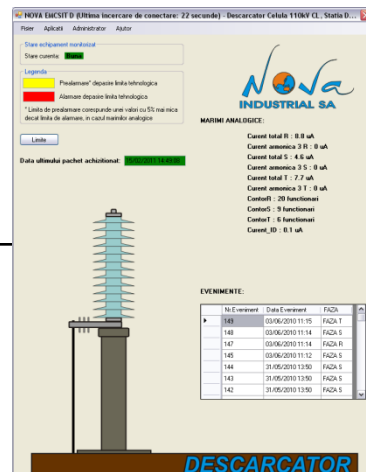
**NOVA TRAFOMON 5**



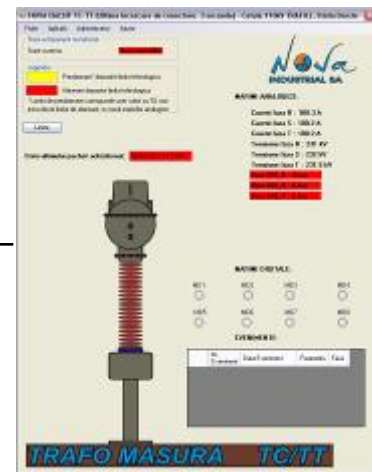
**NOVA EMCSIT - I**



**NOVA EMCSIT - S**



**NOVA EMCSIT D**



**NOVA EMCSIT - TC/TT**

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# SOFTWARE

**NOVA OHLM software systems** dedicated for the on-line monitoring of high voltage overhead power lines, enables:

- **setting the threshold limit values** or/and conditions for the on-line monitored parameters: rated electric current through the line conductor; rated temperature of line conductor, maximum conductor sag, maximum conductor tension, etc.;
- **online data acquisition and processing;**
- **generating warnings / alarms** in real time, when the permissible limits of parameters are exceeded;
- **data storage in a local database** (for a limited time) and in a PC server database from asset management / monitoring center (monitoring parameters, alarms/ trips, limit values or/and conditions, etc.) ;
- **displaying of the online measured parameters**, via a web interface, using an internet browser.

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# SOFTWARE

**OHLM software** allows users to access and to view:

- **on-line monitoring data** for monitored towers and overhead lines (the selection of line and tower is made from two dropdown lists, and information is appropriately updated in visually distinct modules);
- **report of the momentary** data - report with instantaneous information about the monitored values;
- **historical data - information** of the monitored parameters, presented in table and graphs forms;
- **data and self-testing** calculations;
- **database**, etc.

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# SOFTWARE

**OHLM system software** assures the calculation of OHL's operating parameters **for** static line rating and dynamic line rating (**DLR**),

**knowing:**

- ✓ *the maximum admissible temperature and current of the line conductor;*
- ✓ *the maximum functioning current of the apparatus (circuit breakers, disconnectors and current transformers) in the line cells of substations A and B (interconnected by transmission line);*


**and predicting:**

- ✓ *the ambient conditions on a prescribed time period.*





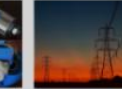
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## OHLM v.1.0

Utilizator: bgn    Tip utilizator: Superadministrator    Sucursala: ST CONSTANTA    Companie: CNTEE TRANSELECTRICA SA    November 23, 2016 15:28:33    Logout

Monitorizare    Administrare BD    Raport date momentane    Analiza istoric    Calcule si autotestare    Dynamic Line Rating (DLR)    Logger

ISACCEA- TULCEA VEST    STALP 25    Data achizitiei: 23/02/2016 16:30:36 pentru Stalpul nr. 25 de pe linia 400 kV ISACCEA- TULCEA VEST

### Date despre linie si stalp

Denumire LEA: ISACCEA- TULCEA VEST

Tensiune nominala [kV]: 400

Tip constructiv LEA: Simplu circuit

Lungimea LEA [km]: 31.4

Numar total stalpi: 94

Numar conductoare pe faze: 2

Tip conductor: ALOLN 450/75 mm<sup>2</sup>

Nr stalp: 25

Latitudine [°]: 45.215

Longitudine [°]: 28.498

Detalii conductor    Detalii LEA

### Date meteo

Temperatura ambienta [°C]: 19

Viteza vantului [m/s]: 0.61

Directia vantului [°]: 90

Radiatia solara globala [W/m<sup>2</sup>]: 800

Umiditate relativa [%]: 62.3

Detalii meteo

### Parametrii de functionare LEA

Curentul prin subconductorul LEA [A]: 827.6

Temperatura subconductorului LEA [°C]: 50.1

Fora de tractiune conductor LEA [kN]: 27.88

Inclinare [°]: 5.865

Sageata (Inclinare) [m]: 7.7

Sageata (Videosagometru) [m]: 7.3    Detalii

Sageata (Curent & meteo) [m]: 7.41

Sageata (Fora de tractiune & meteo) [m]: 7.38

Sageata (Temperatura & meteo) [m]: 7.44

Sageata (Spectral) [m]: 7.2    Detalii

Sageata [m]: 7.7

Gabarit [m]: 22.3

Oscilatii unda scurta (vibratii)

Amplitudine [cm]: 0.04

Frecventa [Hz]: 32.78

Oscilatii unda lunga (galoparea)

Amplitudine [cm]: 0

Frecventa [Hz]: 0

Chiciura (conditii producere): DA    Detalii

Chiciura (prezenta): NU

Chiciura (depunere) [mm]: 0

### Stare LEA

Stare LEA: BUNA

### Alarmer functionale

Alarma gabarit: NU

Alarma temperatura: NU

Alarma curent: NU

Alarma fora de tractiune: NU

Alarma inclinare stalp: NU

Alarma incendiu: NU

### Alarmer meteo

Alarma vant: NU

Alarma uragan: NU

Alarma chiciura: NU

Alarma galopare: NU

### Alarmer vandalism

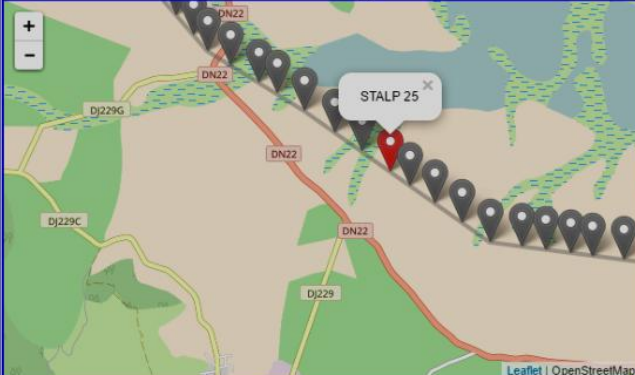
Alarma taiere/rupte ancore: NU

Alarma lovire cu ciocanul: NU

Alarma taiere cu flexul: NU

Alarma intruziune PIR: NU

Alarma intruziune video: NU



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# SOFTWARE

Online monitoring system NOVA OHLM may be a viable solution for applying DLR technology in operation of overhead transmission lines.

No.	Operating parameters	Values								
1	Environment Temperature	40	35	30	25	20	15	10	5	0
2	Wind direction	90								
3	Current through the LEA conductor [A]	760	855	940	1020	1090	1160	1220	1280	1337
4	Conductor temperature [°C]	67,2	67,1	67,1	67,2	67,1	67,2	67,1	67,1	67,2
5	Conductor sag [m]	7,339	7,336	7,336	7,339	7,336	7,339	7,336	7,336	7,339
6	Conductor tension [kN]	28,157	28,17	28,17	28,157	28,17	28,157	28,17	28,17	28,157
					Alarm for equipment current limit				+ Alarm for equipment conductor limit	

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# SOFTWARE

**NOVA INDUSTRIAL S.A.** developed and implemented **TRANSPower - expert system** created for the management of the technical condition of primary equipment from substations and the management of the maintenance activity (expert system developed for each category of primary power equipment: **power transformers and shunt reactors, circuit breakers, disconnectors, current transformers and voltage transformers, surge arresters**).

The **Nova TRANSPower expert system** **proved to have very good results** in practice, at CNTEE Transelectrica, comparing to other similar systems.

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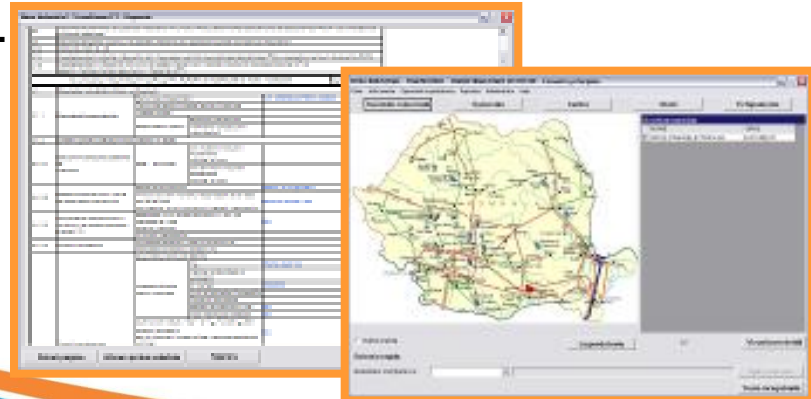
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# SOFTWARE

**TRANSPOWER software** allows:

- **setting up a complex database** (containing the entire range of information required to diagnose the momentary condition);
- **registering the individual behavior** of each equipment in operation;
- **optimizing the maintenance activity** and the management of the high voltage equipment park;
- **establishing the predictive or preventive maintenance program** for each high voltage equipment;
- **establishing the behavior of a family of high voltage equipment** (including accessories);
- **calculating for each type of prophylactic measurement** the so-called "normal values" for a homogeneous family of high voltage equipment;
- **anticipating the volume and the cost of the required annual activities** as part of the maintenance program.



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# SOFTWARE

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## SOFTWARE

### Software for on-line monitoring

TRAFOMON, for power transformers and shunt reactors,

NOVA EMCSIT - I, for high voltage circuit breakers

NOVA EMCSIT - S, for high voltage disconnectors

NOVA EMCSIT - D, for high voltage surge arresters

NOVA EMCSIT TC/TT, for current and/or voltage instrument transformers

### Expert Systems

TRANSPOWER - PT, for power transformers and shunt reactors,

TRANSPOWER I, for circuit breakers

TRANSPOWER S, for disconnectors

TRANSPOWER D, for surge arresters

TRANSPOWER TC/TT, for current and voltage instrument transformers

NOVA PREDICT, for safety levels

HUMIDITY EXPERT SYSTEM HES 6, for solid insulation humidity

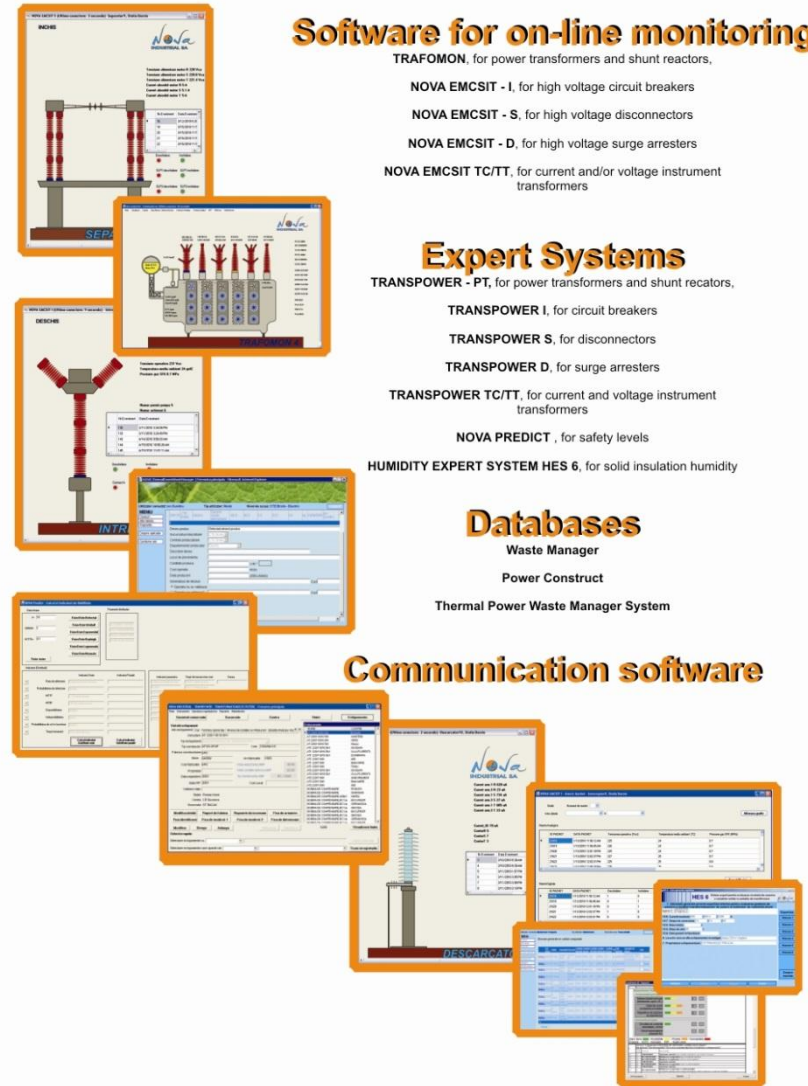
### Databases

Waste Manager

Power Construct

Thermal Power Waste Manager System

### Communication software



# R&D activity

**In terms of R&D activity**, Nova Industrial S.A. benefits from the experience as ***leader of the R&D projects*** developed and funded through the innovation, research and development programs, such as :

**Contract no. 26/2017** (Structural funds- O2.2.1), Period: 2017-2020 „Innovative integrated ICT (Information and Communication Technologies) system for real-time control and monitoring of electricity quality and losses on transport and distribution lines in the National Energy System;

**Contract no. 33/2014** (Program: Partnerships in priority areas, PN-II-PT-PCCA-2013-4-0259), Period: 2014-2016 “***Integrated monitoring and control system for full real-time estimation of functional condition of assembly electrical networks***” /SIMCEC);

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## R&D activity

**Contract no. 475 / 2013** (Structural funds- O2.3.3), Period: 2013-2015  
***“Synchronized system of Smart Grid type for complex monitoring of high voltage substations” / SINCRO SMART;***

**Contract no. 485/2013** (Structural funds- O2.3.3), Period: 2013 - 2015  
***„Complex system for on and off-line monitoring of high voltage assets of national power system” / ACTIV-SMART;***

**Contract no. 144/2008** - INOVATION (Ministry of Education, Research and Innovation Romania), Period: 2008 - 2011 ***“Equipment for complex monitoring of high voltage substations”/ EMCSIT;***

**Contract no. 27/2006** (Ministry of Economy and Commerce ), Period: 2006 – 2007 ***“Waste management at power plants. A pilot application thermoelectric plant” /ThermalPowerWasteManager.***

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## Patents:

*"Method and system for complex on-line monitoring of high voltage substations"*  
Patent Romania no. 125932/2012;

*"Method and system for on-line monitoring of operating parameters a high voltage overhead power lines, integrated in Smart Grids "*, the patent application no. a201500269/04.20.2015;

*"Method and system for on-line monitoring of the physical condition, anti-vandalism and anti-terrorism, of high voltage overhead power lines"* patent application no. a201500277/04.22.2015;

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## Patents:

*"Method and system for real time, on-line measuring and intelligent monitoring of electricity produced / transported / distributed / supplied and electric power quality", patent application no. a201500405/ 11.11.2015;*

*"Intelligent apparatus and method for monitoring and recording of disturbances in power transformers, respectively in transmission and distribution power systems" demand patent no. a2015 01038 / 23.12.2015;*

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## Software licenses

•Software licenses of **NOVA TRANSPOWER** expert system for “Operations and technical condition management of the assets in transmission and distribution power systems”, modules:

- **TRANSPOWER PT** for power transformers and shunt reactors;
- **TRANSPOWER I** for circuit breakers;
- **TRANSPOWER S** for disconnectors;
- **TRANSPOWER TC** for current transformers;
- **TRANSPOWER TT** for voltage transformers;
- **TRANSPOWER D** for surge arresters;
- **TRANSPOWER OHL** for overhead power lines, etc.

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# KNOW -HOW

- **Software licenses of “NOVA EMCSIT complex systems for on-line monitoring of high voltage substations”, for data acquisition, processing, storage, etc. modules :**
  - ✓ **TRAFOMON 5**, for on-line monitoring of power transformers/shunt reactors;
  - ✓ **NOVA SMT**, for on-line monitoring of transformer/shunt reactor bushings;
  - ✓ **NOVA EFBR**, for on-line monitoring of the transformer/shunt reactor cooling system;
  - ✓ **NOVA CBR**, for controlling operation of transformer/shunt reactor cooling system;

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# KNOW -HOW

- ✓ **NOVA CRS**, for on-line monitoring of transformer on-load tap changer;
- ✓ **NOVA M**, for on-line monitoring of oil conservator membrane condition;
- ✓ **EMCSIT I**, for on-line monitoring of high voltage circuit breakers;
- ✓ **EMCSIT S**, for on-line monitoring of high voltage disconnectors;
- ✓ **EMCSIT TT**, for on-line monitoring of voltage transformers;
- ✓ **EMCSIT TC**, for on-line monitoring of power transformers;
- ✓ **EMCSIT D**, for on-line monitoring of high voltage surge arresters;
- ✓ **EMCSIT Dynamic** for real time, on-line monitoring of operating condition of high voltage substations;

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# KNOW -HOW

- **Software licenses** of **NOVA HES 6 Humidity Expert System** – expert system that determines the humidity in the solid&liquid insulation of power transformers using six methods of diagnosis;
- **Software licenses** of **NOVA Predict** – software which completes the TRANSPOWER expert system and determines the reliability indicators of the primary equipment, for the purpose of ensuring the safety levels;
- **Software licenses** of **PowerConstruct** – software that creates and administrates a database on the power constructions of a transmission or distribution company, that includes: electrical power lines, substations, buildings, etc.

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# KNOW -HOW

- **Software licenses** of **WasteManager** – software that creates and manages a database for the waste management at a transmission or distribution company, following the waste process from production to final usage, destruction or recycling;
- **Software licenses** of **ThermalPowerWasteManager** - software for waste management at power plants.

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# AFFILIATIONS

**NOVA INDUSTRIAL** is a member of many professional organizations, such us:

- **The National Committee of International Council on Large Electric Systems (CNR-CIGRE);**
- **The Romanian Committee of Word Energy Council (CNR-WEC);**
- **The Romanian National Committee of the International Electrotechnica; Commission (CNR-IEC);**
- **The Romanian Life Working Association (A-LST-R);**
- **The Academy of Romanian Scientists (AOSR).**

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For further questions, please contact us at:

**SC NOVA INDUSTRIAL SA**

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