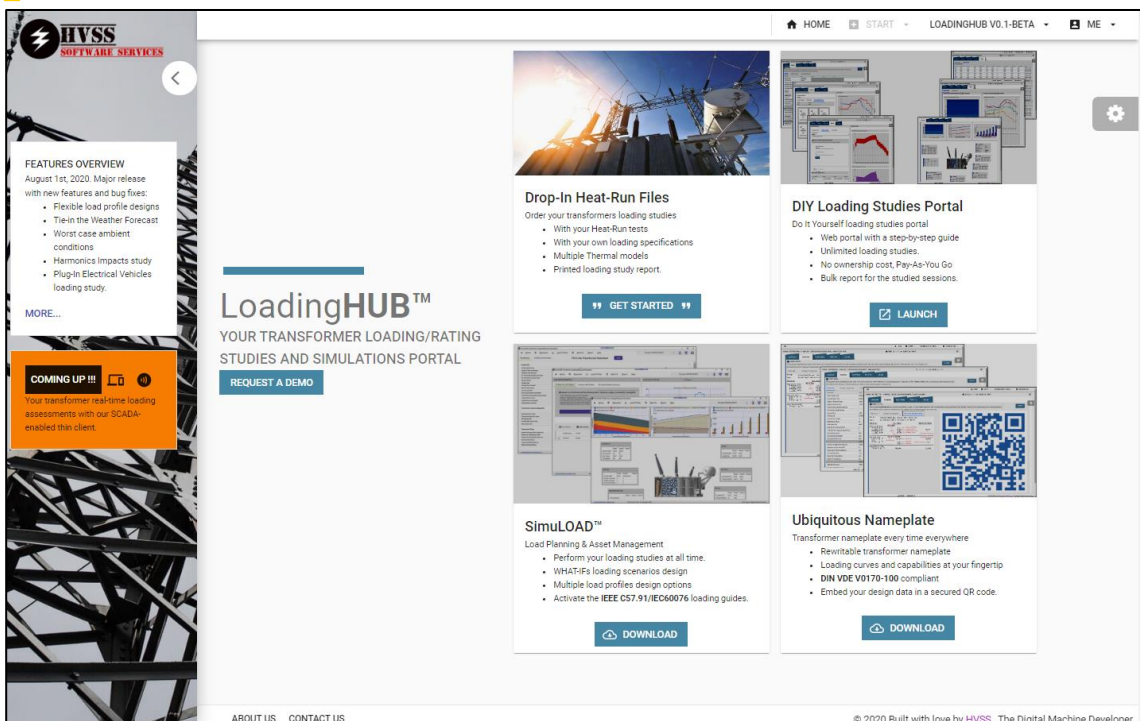




LoadingHUB™ : Flexible Loading Software Platform

A unique and powerful platform designed to allow Load Planners, Maintenance Engineers, and Assets Managers to take full control of their transformer through advanced load simulations and intuitive interfaces. One platform, multiple options :

1. Drop-In Heat-Run and custom specifications files for transformers loading studies
2. Do It Yourself (DIY) Web Portal for flexible and unlimited loading studies
3. SimuLoad™: On-premise software for advanced loading scenarios simulation
4. uNamePlate : An IP-Protected hosted, customizable service that periodically delivers your transformers loading capabilities.



How much energy can I pass through my transformer ?

Key Benefits

- Industry standard-based calculation methods : IEEE C57.91-2011/IEC60354 - 60076, "Loading Guides for Oil-Immersed Power Transformers
- Simple, intuitive graphical interfaces supplemented by extensive technical help.
- Batch simulation of user-defined loading scenarios vs. ambient conditions and predefined load profiles
- Determine transformers marginal loading capability, thermal limits and aging.
- Periodic/On-demand delivery of your transformer loading capability for Normal and Emergency modes.
- Register your transformers and access their loading performances every time, everywhere.
- Transformer performance optimization closer to their real operating temperatures and life-cycle limits without compromising their life expectancy or reliability.
- Printable/exportable unit specific loading study report.

For further information please contact or visit us at
High Voltage Software Services, a division of METLAB Research Inc.
4453, Beaubien-East, Suite 5, Montreal, Quebec, H1T 1T3, CANADA

contact@transformer-analytics.com
www.transformer-analytics.com
Tel: +1 514 637 1395



HVSS
SOFTWARE SERVICES

LoadingHUB™ Platform Provides ANSWERS to Frequently Asked Questions.

LOAD PLANNERS

When Load Planners Ask

- How much marginal load capability do we have now and/or will we have at today's peak ambient temperature?
- Is it safe to shift added load to this unit today's or at some future temperature scenario?

When Load Planners Ask

- What's our average unit temperature and how much margin remains there across the fleet?
- What incremental or reduction in load may be applied to problematic unit(s) in summer Months?
- What opportunities exist for added unit load in Winter?

ASSET MANAGERS

When Asset Managers Ask

- Are we operating units within IEEE/IEC and company loading policy?
- Is the unit(s) hotter than predicted at simulated ambient temp and load?
- What is maximum load at the current ambient temperature ?

When Asset Managers Ask

- Do the manufacturers thermal model apply as predicted? Or not?
- Which units are at full potential in normal and emergency modes?
- How much margin or time is there before it needs to be replaced?

MAINTENANCE PLANNING ENGINEERS

When Maintenance Planning Engineers Ask

- Should we limit substation load capacity due to excessive loss of insulation life ?
- Are recent changes in DGA values due to added temperature at this load?
- Is this unit hotter than "Normal" loading? By How much?

When Maintenance Planning Engineers Ask

- Do we have a cooling problem? How long has it been, or can we operate like this?
- Can we safely shift load to neighboring unit(s) during scheduled or sudden outage ?
- How much hotter will it run? How much insulation life will be consumed ?

MANUFACTURERS (OEMs)

When Manufacturers Ask

- How can I track the performance of a commissioned transformer?
- Is the unit(s) hotter than predicted at varying weather conditions?
- What is maximum load at the current ambient temperature ?
- How can I use the learning experience from a fully operating unit to improve my future design?


Do more with Your Transformer Nameplate and Certified Heat-Run Test Reports



- Drop-in areas for certified factory final (heat run) test results, load profiles, and other specific requirements
- Operation conditions and constraints specification
- Default thermal models to IEEE C57.91-2011, and IEC 60354 - 60076, "Loading Guide for Oil-Immersed Power Transformers"

- Detailed transformer datasheet and load profiles
- WHAT IFs Normal and Emergency Loading Scenarios
- 24-h Thermal Results and Loading Curves
- Optimized limits of temperatures, loads, and Insulation loss of life
- Marginal load and status (Underloaded, Normal, Overloaded)





<Cooper-ONAN/ODAF/ LOADING STUDY REPORT >

The purpose of this report is to present the loading capability of the <Cooper> transformer. This is achieved with the consideration of a broad range of ambient temperatures, user-defined load profiles, and loading constraints. The loadability is evaluated according to the IEEE Std C57.91 and the IEC 60076-7 loading guides thermal models. The results are presented in terms of the optimum load and load margins vs. ambient temperature range and time, the Hottest spot temperature and insulation loss-of-life vs. ambient temperature range and time.

1 - User Supplied Inputs

From the Heat-Run test results and the nameplate, the following dataset has been established.

1.1 - Transformer Design and Nameplate Inputs

Solid Insulation Type	TUK		kV
Weight of Tank and Filings	105426		pounds
Weight of Core and Coils	417776		pounds
Per Unit Winding Height to Hot Spot	1		p/u
Per Unit Eddy Loss @ Hot Spot	1.3		p/u
Volume of Fluid	21423		Gallons
Winding Type	COOPER		
Winding Time Constant	5		Minutes
Rated Ambient (T _a)	40		Hours
Core Losses, (P ₀)	89000		Watts
Core Loss During Over Excitation	0		Watts
Time When Over Excitation Occurs (hour)	0		Hour
Cooling Power per Fan	5000		Watts
Cooling Power per Radiator	2000		Watts
Cooling Power per Pump	6000		Watts
ONAN	ODAF	-	
Base Rating for Losses	180000	300000	kVA
Temperature Base for Losses	80	85	Celsius
DR Losses, (P _W)	241273	673000	Watts
Winding Eddy Losses, (P _e)	24738	60000	812400
Stray Losses, (P _s)	21510	60000	136668
One Per unit base kVA for full cycle	180000	300000	kVA
Rated Avg. Winding Rise (ΔT _w)	65	65	Kelvin
Tested Avg. Winding Rise (T _w)	43	65.1	52.36
Hot Spot Rise (T _h)	61.8	73.8	74.75
Tested Top Oil Rise (T _o)	48.7	55.6	56.33
Bottom Oil Rise (T _b)	17.1	61.2	26.13
Number of Fans/Coolers	0	0	2
Number of Radiators	4	4	4
Number of Pumps	2	2	2

1.2 - Ancillary Components

Primary Rated Voltage (HV)	180		kV
Secondary Rated Voltage (LV)	200		kV
Tertiary Rated Voltage (TV)	330		kV
ONAN	ODAF	-	
Primary Rated Amps(H)	10	0	0
Secondary Rated Amps(X)	10	0	0
Tertiary Rated Amps(T)	10	0	0
			Amps

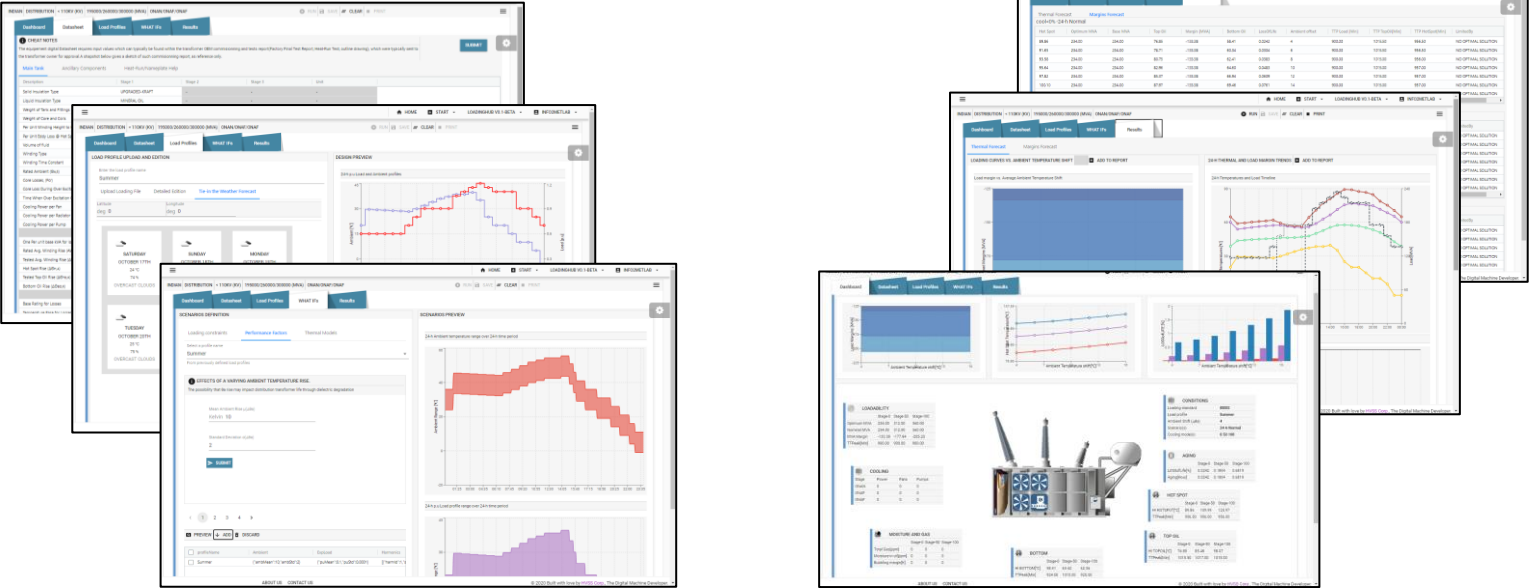
contact@transformer-analytics.com
www.transformer-analytics.com
 Tel: +1 514 637 1395

DIY Portal: A Do-It-Yourself Service For Transformer Loading Study

Hosted services

- Step-by-step guide from unit creation to study run
- Csv Formatted 24-h Load Profile File Upload
- Unlimited loading studies.
- No ownership cost, Pay-As-You Go
- Industry standard-based calculation methods (IEEE/IEC).

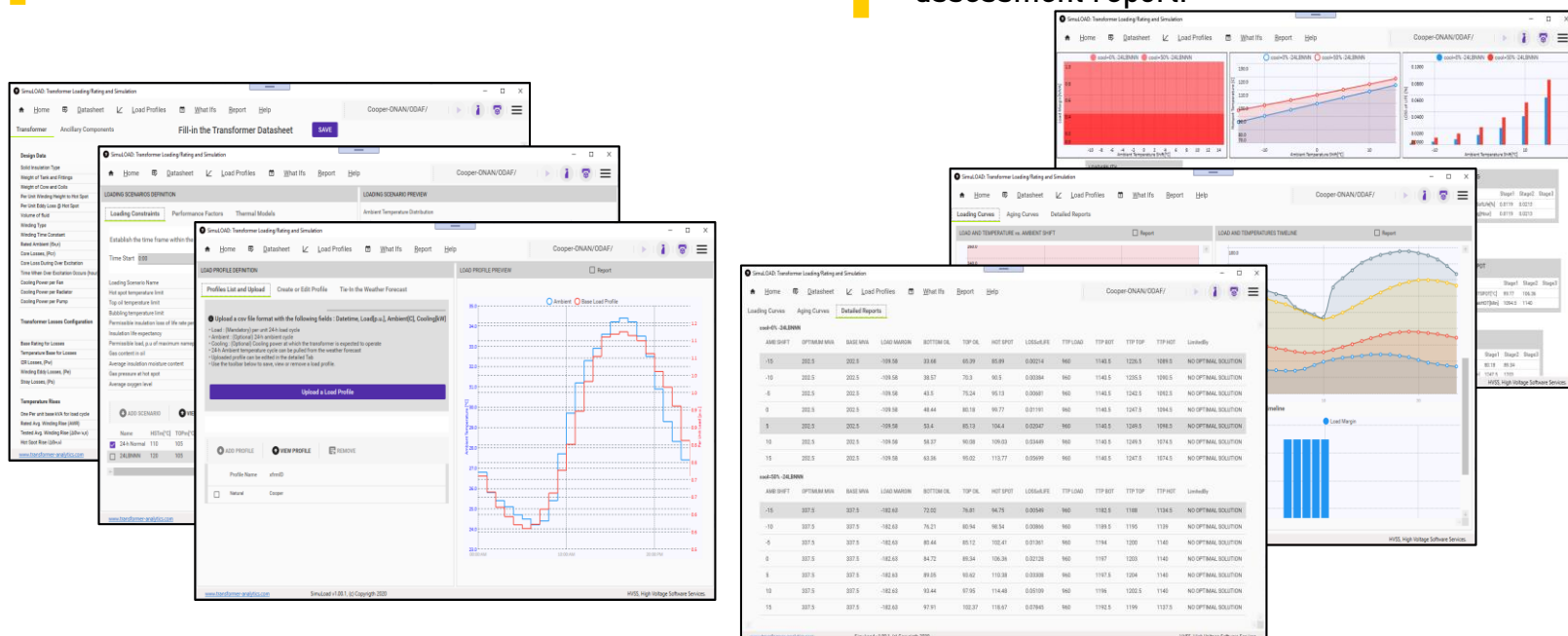
- Impacts study of the loss of cooling or tap position change.
- Worst case ambient conditions simulation
- Uses the weather forecast for accurate load planning.
- Experimental loads study
- Bulk report for the studied units.



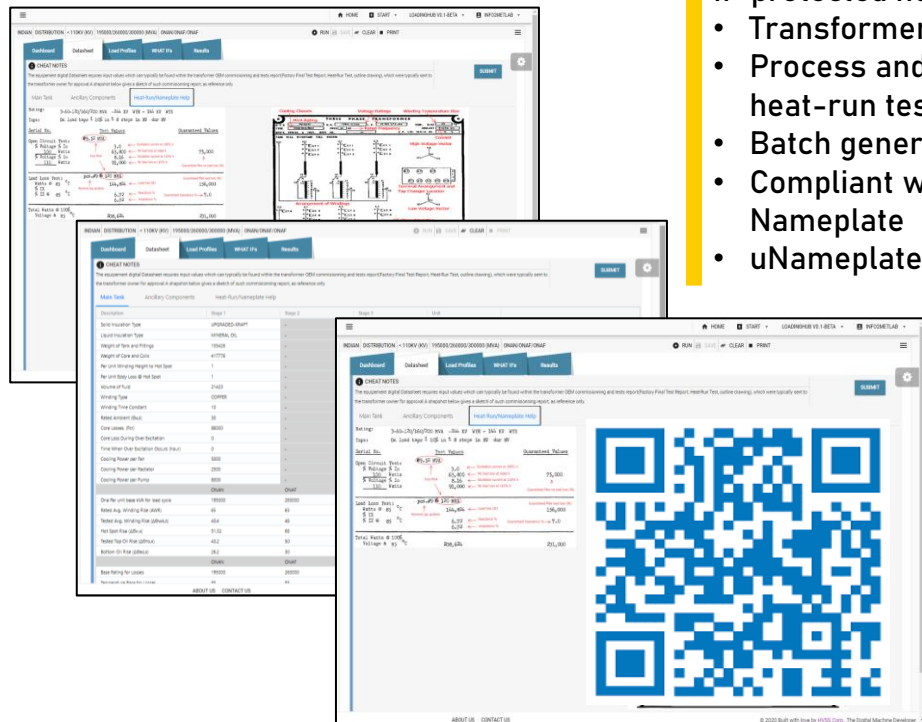
SimuLoad™ : On-premise Transformer Rating and Load Planning Software

- Perform your loading studies at all-time.
- License-based, one-time ownership cost
- Simple, intuitive graphical interface supplemented by extensive technical help.
- Seasonal load and ambient profiles design based on existing utility loading practice
- Optimize loading limits and margins for Normal and Emergency loadings

- Multiple units' creation and load planning.
- Impacts study of the loss of cooling or tap position change
- Worst case ambient conditions simulation
- Seasonal load and ambient profiles design
- Custom design WHAT IFs loading scenarios.
- Printable/exportable unit specific loading assessment report.

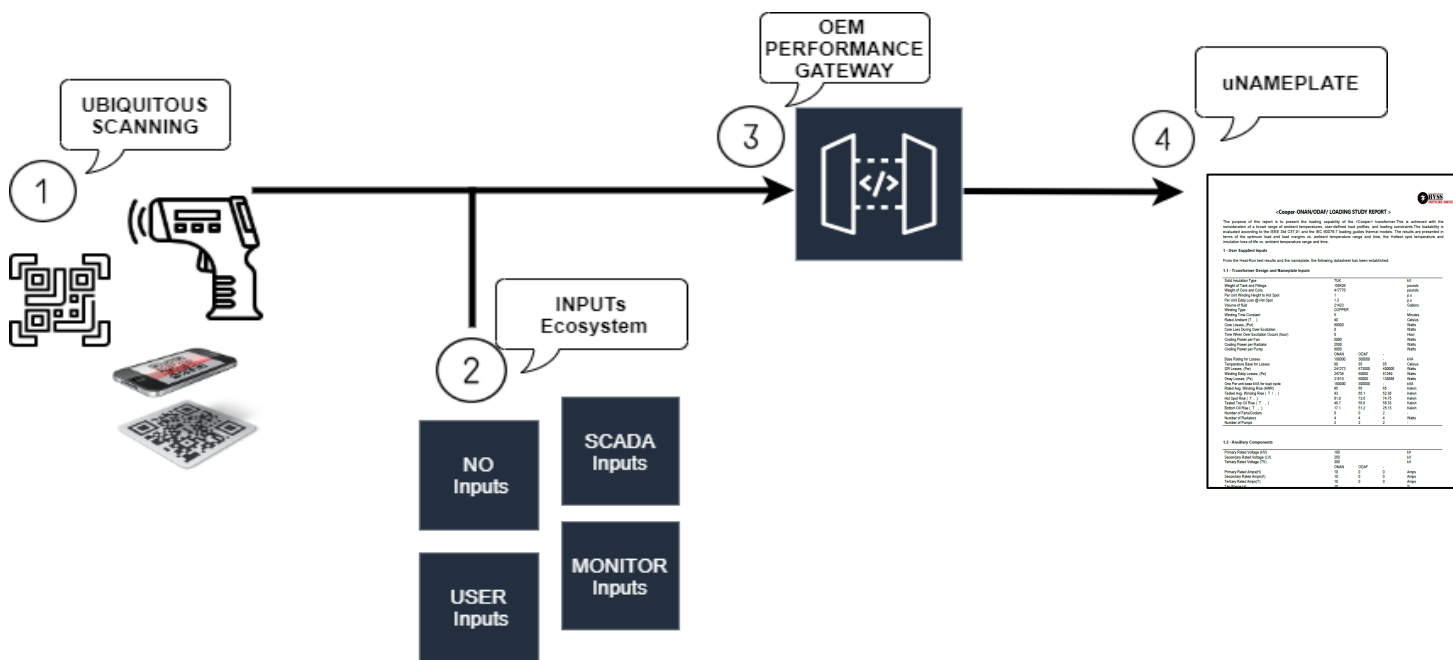


uNamePlate™: Ubiquitous Nameplate



- Secured access to your nameplate every time, everywhere.
- Your transformer loading capability at a fingertip
- Loading curves and thermal performances
- Marginal loads and status (underloaded, normal, overloaded)
- All delivered for the worst-case ambient conditions in both normal and emergency modes.

- Dynamic periodic/on-demand nameplate rewriting
- Health Index tracking when combined with Monitors/Scada Inputs
- Availability (Uptime vs. downtime)
- Customizable to OEMs KPIs and transformer design



GOT YOUR OWN PROJECT TO DISCUSS ABOUT ?
Please feel free to reach out.

For further information please contact or visit us at
High Voltage Software Services, a division of METLAB Research Inc
4453, Beaubien-East, Suite 5, Montreal, Quebec, H1T 1T3, CANADA

contact@transformer-analytics.com
www.transformer-analytics.com
Tel: +1 514 637 1395