Section 1: Unique Advantages of the leading hydraulic analysis software engineers prefer to use:

- *PIPENET’s schematic design is unique.*
- *PIPENET interface is flexible and easy to use.*
- *The creation of the large and complex networks is fast and efficient.* Please refer to Section 3 for examples.

**PIPENET Transient** combines simplicity with powerful capability.

**PIPENET Transient** can model pipes, short pipes, simple pumps, turbo pumps, inertial pumps, operating valves, control valves, check valves of several types, surge relief valves, pressure regulators, bursting discs, accumulators, surge tanks, simple tanks, receiving vessels, caisson of several types, pressure sensor, flow sensor, differential pressure sensor, PID controller, transfer functions, Cascade controllers, switches, general pressure loss component and others.

**PIPENET Transient** can calculate force-time history and has interfaces with leading pipe stress analysis programs.

**PIPENET Transient** delivers accurate results with output data on the model, in the report generator and on the graphs easy to view and understand.

**PIPENET Transient** is based on the Industry Standard technology contained in Fluid Transient in Systems by Wylie and Streeter.
**PIPENET Transient** is used in many Industries such as the Oil & Gas, Power, Petrochemical and Water Industries for hydrocarbons, water and steam. It is also virtually a Standard in the GRP/FRP and Plastic pipe Industries.

**PIPENET Transient** delivers rapid convergence times for transient calculations and many different scenarios can be looked at in quick succession.

---

**Pressure envelope**

![Pressure envelope graph]

- **Elevation profile**
- **Minimum pressure**
- **Maximum pressure**

**Distance / m**

**Pressure / Bar**

- 0
- 20
- 40
- 60
- 80
- 100
**PIPENET  Vision Transient Module - The Features**

1. **Copy/paste function:** Copy, cut, and paste functions are available for whole sub-networks including schematic and data. Copy and paste between different networks or within the same network. With this facility, it is easy to build a large network quickly and easily. The hot keys available for copy cut and paste functions increase speed and efficiency even further.

2. **Clear results display:** The calculation results can be presented in both text format and graphic format. PIPENET has a powerful graph viewer, which can modify the graph, such as add text label, add the arrow, overlap graphs, adjust axis, etc. These can help user to produce the report quickly and professionally. All the graphs can be copied to other software, such as WORD and Paint. The animation is also available in PIPENET.

3. **Multiple components creation tools:** “Add multiple pipes” tool is especially useful in creating multiple pipes at the touch of a button.

4. **“Area” tool and “polygon” tool:** With those two tools, simply choose an area in the schematic using the mouse, then copy, cut, paste, delete, mirror, invert and rotate all the components in this area in one step. This really saves time!

5. **Interface with WORD:** PIPENET can export the schematic to clipboard, and then paste in other programs such as WORD.

6. **Interface with EXCEL:** PIPENET is compatible with the spreadsheet programs, such as EXCEL. Data and tables can be imported to EXCEL, or exported from EXCEL, giving the engineer total flexibility.

7. **Component graphical manipulation:** The components can be flipped or rotated by dragging the ends of the components to suit a user’s preference. Mirror, invert and rotate functions are also available to flip or rotate components. In addition, Undo/ redo, zoom/pan, schematic overview, combination of subnets, and an easy to use data window also make the component graphical manipulation a simple task.

8. **Global edit function:** Using this function, the attributes for all the components can be edited in one step.

9. **Data table:** PIPENET presents all the data in table format. The table is clear, easy to read and can be easily modified.
10. **Sorting function:** Sort the data as you prefer in the data window. For example the pipes can be sorted according to the velocity and the nozzles can be sorted according to the deviation.

11. **Colouration:** All the nodes, pipes and nozzles can be coloured according to a certain attribute.

12. **Interface with the plotter:** PIPENET can export the schematic as HP-GL/2 format.

13. **Interface with AutoCAD:** PIPENET can export DXF file.

14. **Autosave:** The engineer can specify the frequency at which the autosave operations should be performed.
PIPNENET is renowned for outstanding comprehensive, fast, accurate and reliable modelling.

15. **Comprehensive modelling tools:** PIPNET provides totally comprehensive modelling tools, including
   - Pipes: pipe, short pipe and compressible pipe
   - Pumps: simple pump and turbo pump
   - Valves: operating valve, non-return valve, check valve, fluid damped check valve, liquid surge relief valve, pressure surge relief valve, regulator valve, inertial check valve, vacuum breaker and bursting disc.
   - Reservoir components: accumulator, surge tank, receiving vessel, simple tank and three different caisson types.
   - Control systems: flow sensor, pressure sensor, pressure difference sensor, PID controller, cascade PID controller, transfer function and switch.
   - Others: general pressure loss component and equipment component.

16. **Fluid properties:** User can define fluid directly, using PIPNET water-steam tool or using PIPNET API fluid tool.

17. **Powerful network solving ability:** No matter how complex a network, and how many loops are included, the network can be solved precisely and quickly!

18. **Forces:** PIPNET has the unique function to calculate both of hydraulic transient forces, including both simple force and dynamic force, in the piping systems. PIPNET also have an interface with stress analysis program Caesar.

19. **Libraries:** Extensive libraries are available for pipe schedules, simple pumps, turbo pumps, fittings, control valves and general pressure loss components. User can add often-used components to a library, and so avoid re-inputting components.

20. **Fittings:** Most popular fittings are available as the built-in fittings in PIPNET, such as tilting disc, 3 way cock, elbow, bend, angle-stop check, ball valve, butterfly valve, gate valve, globe lift check, globe swing check, globe valve, globe/angle valve, globe-stop check, hinged foot valve, pipe exit, plug valve, poppet foot valve, projecting entrance, return bend, sharp
flush entrance, tee, Y-pattern valve, Y angle-stop check, Y globe-stop check, Y lift check and Y swing check, etc. User can also define their own fittings.

21. **Pump curves**: PIPENET has three different types of pump curve: quadratic, cubic and spline smooth. Pumps can be defined flexibly, precisely and easily with these options.

22. **Checking facilities**: PIPENET provides helpful checking facilities, for example PIPENET can identify an elevation error easily.

23. **Units**: PIPENET has convenient unit options, including SI, Metric, British, US, and user defined. The user defined unit option allows users to define their own preferred unit combination and save it as a default.

24. **Default values**: Set up default values for the common attributes, and there will be no need to re-input values in the table.
User friendly interface and powerful function are not the only guarantee. PIPENET’s customers benefit from many additional advantages!

25. **Acceptability:** Wherever you go, PIPENET is accepted, approved and frequently required.

26. **Comprehensive help information:** PIPENET provides comprehensive help information through the Sunrise website: [www.sunrise-sys.com](http://www.sunrise-sys.com), help manuals, user manuals, training manuals and PIPENET News. Sunrise Systems Limited also organizes seminars and training courses to help users to enjoy the many features of PIPENET.

27. **Customer support:** Sunrise Systems Limited provides prompt, friendly and professional customer support. Customer service to support our outstanding product is our first concern!

28. **High quality standard:** Sunrise Systems Limited is qualified with ISO9001.
Section 2 - **PIPENET** Transient Selected Applications

Lube Oil Export Line

![Diagram of Lube Oil Export Line](image)
Large Cooling Water System

- Supply
- Cooling Tower
- Return
- Operating Valve
Crude Oil Transfer Line from FPSO to Shuttle Tanker

[Diagram of the crude oil transfer line from FPSO to Shuttle Tanker]

[Graph showing the flow rate and pressure over time]
600 MW Supercritical Power Plant Turbine Trip – Main Steam Line
Subsea Crude Oil Pipeline System

Pressure envelope

Elevation
-75,000,000
-60,000,000
-45,000,000
-30,000,000
-15,000,000
m

Pipe length
200,000,000
400,000,000
600,000,000
800,000,000
1,000,000,000
m

Subsea Crude Oil Pipeline System

Elevation profile

Minimum pressure
Maximum pressure
Water Injection System
Miscellaneous Applications