

CLOSING THE LOOP

With Glycol Recycling

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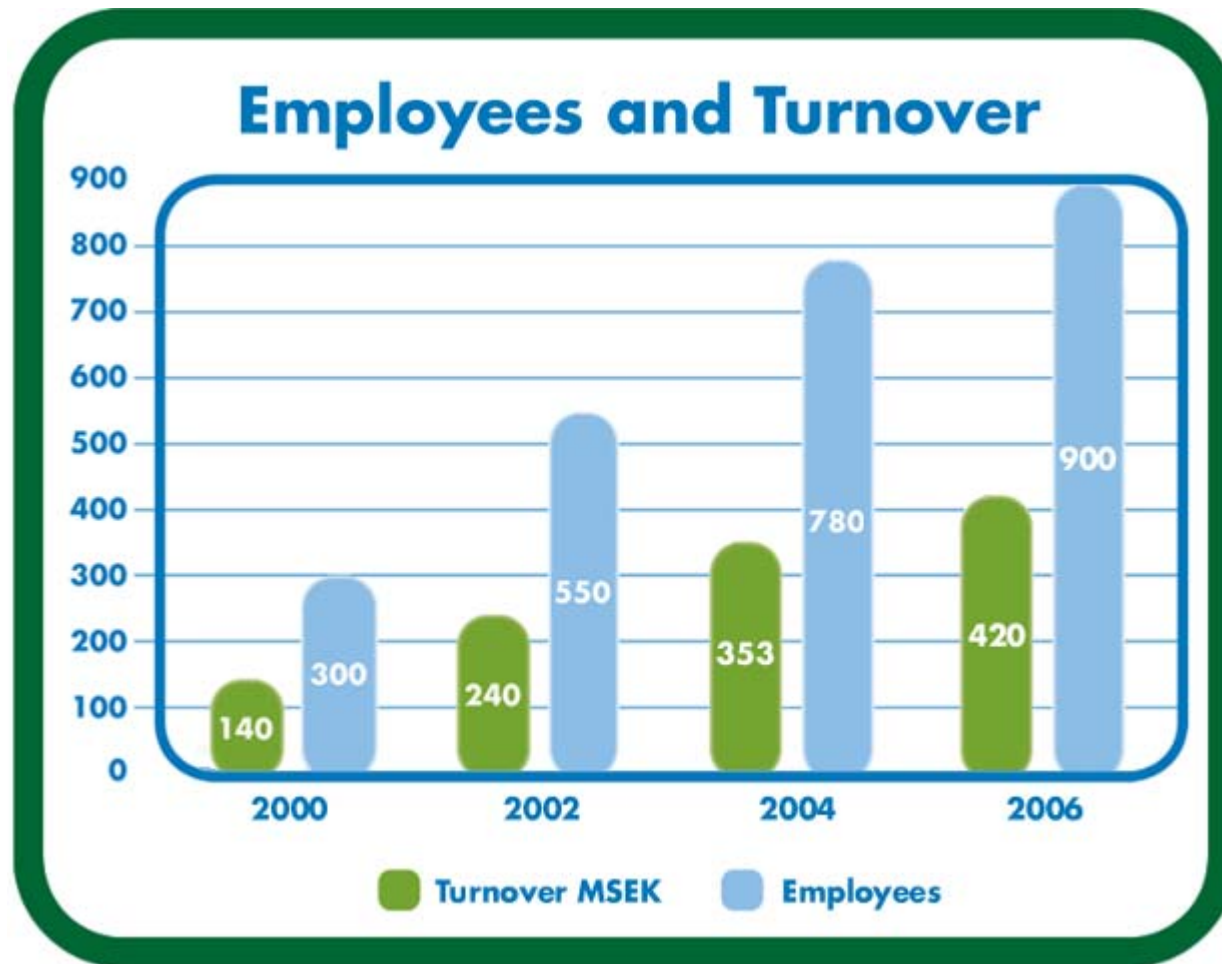


**NOTHI
NGISI
MPOS
SIBLE!**

WHERE WE ARE ...WHAT WE DO



EMPLOYEES-TURNOVER



ENGINEERING COMPANY



NORDIC DINO II & NORDIC DINO

CLOSED LOOP.

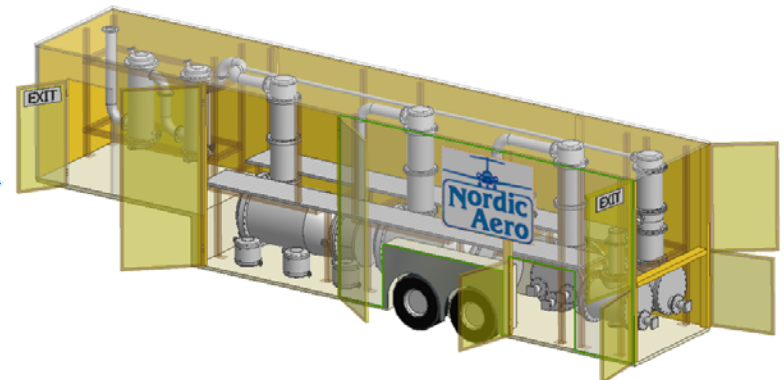
DE-ICING



GLYCOL PICK-UP



GLYCOL RECYCLING



WHY GLYCOL RECOVERY?

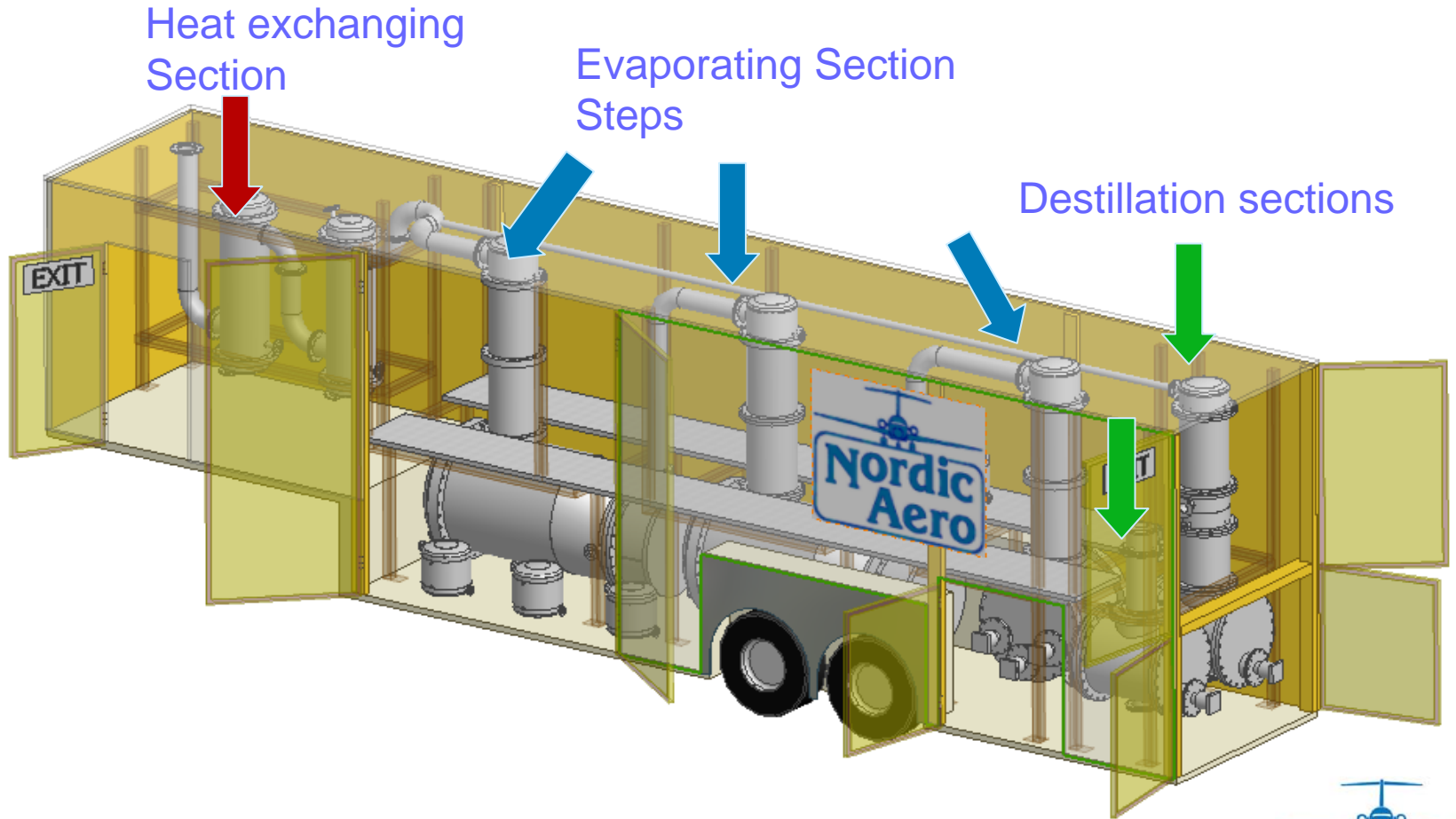
Financial

- Rapidly increasing raw material cost (glycol)
- Decreasing the total cost for the de/anti-icing operation
- Reduction in Waste Water Treatment Costs
- Ever greater demands from water authorities.

Environmental

- The cadmium issue and other heavy metals
- Improves the COD/BOD values for storm water
- Transportation of contaminated water over significant distance not acceptable solution
- Moving disposal centre from loc A to loc B not acceptable solution

HOW - TECHNICAL



SPECIFICATION – PD Distillate

1,2 – Propanediol (Propylene glycol, MonoPropyleneGlykol MPG)

Property	Unit	Value	Method
Purity	% wt	99,5 min	ASTM; E202
1,2 – Ethanediol	% wt	0,1 max	ASTM; E202
Density (20 ⁰ C)	kg/m ³	1,0361	ASTM; D1286; E202
Acidity as Acetic Acid	% wt	0,005 max	ASTM; E202; D1613
Water	% wt	0,5 max	ASTM; E203; E202
Iron (Fe)	mg/l	1,0 max	ASTM; E202
Chlorides (Cl ⁻)	mg/l	1,0 max	USP
Colour (Pt)	mg/l	10 max	ASTM D1209
Refractive Index	(20 ⁰ c)	1,4324	ASTM D1613
Boiling point (100kPa)	(°c)	189	ASTM D88
Ph		7-8	
Glycolic acid	ppm	<20	IC
Formic acid	ppm	<20	IC
Lactic acid	ppm	<20	IC
Acetic acid	ppm	<20	IC
Propionic acid	ppm	<100	IC

OVERVIEW - ARN



THE RECYCLER - EXTERIOR



THE RECYCLER - INTERIOR



CONCLUSION FROM FIRST YEAR OPERATION

- 500 tons of de-icing fluid processed
- To high energy consumption ratio compared with theoretical values

.....and this will be the actions that we are taking

NEXT STEP

- Increase the height of the Colons, which will give lower energy consumption
- Increased amount of processed De-Icing fluid during the season 2007-2008.

REMEMBER...

**NOTHING
IS
IMPOSSIBLE!**