Brief Introduction
To
Induced Symbiotic Osmosis Processes for Saline Fluids Desalination and Power Generation

Austin Presentation- September 2016

MIK Technology

Harnessing The Potential Of Renewable Resources For Sustaining Life.

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Brief Introduction to Induced Symbiotic Osmosis Processes
for Saline Fluids Desalination and Power Generation

1. Brief introduction of the company:

   MIK Technology is a small emerging company with emphasis on developing technologies for harnessing the potential of renewable resources for sustaining life.

2. Technical description of the Technology:

   Maximizing the potential of using earth renewable resources, particularly water and solar energy, to mitigate the devastating impact of global warming due to the overwhelming increase in world population and subsequent increase in the consumption of fossil fuels;

3. Description of its intended application/market segment;

   Worldwide applications, anywhere carbon based energy sources can be replaced.

4. Description of IP and how it is protected;

   All technologies are patented or patent pending by USPTO or Patent Treaty Corporation (PCT).

5. Concise business plan identifying how it is planned to go to market (channels to market, partnering/licensing plans, funding needs, etc.);

   The proposed projects are massive. Cooperation or affiliation with governments and large corporations is necessary.

Note: a List of Patented and Patent Pending Technologies is included on last page,

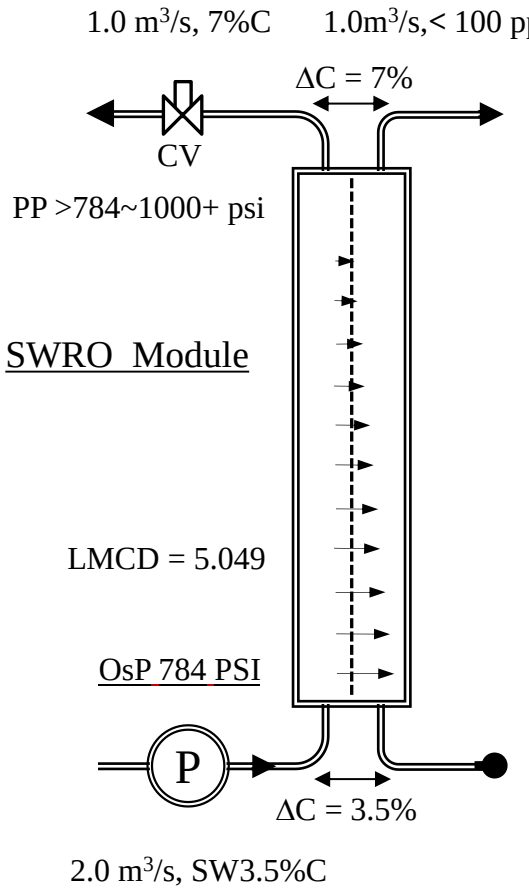


FIG 1a: Conventional seawater reverse osmosis module for **50%** water recovery.

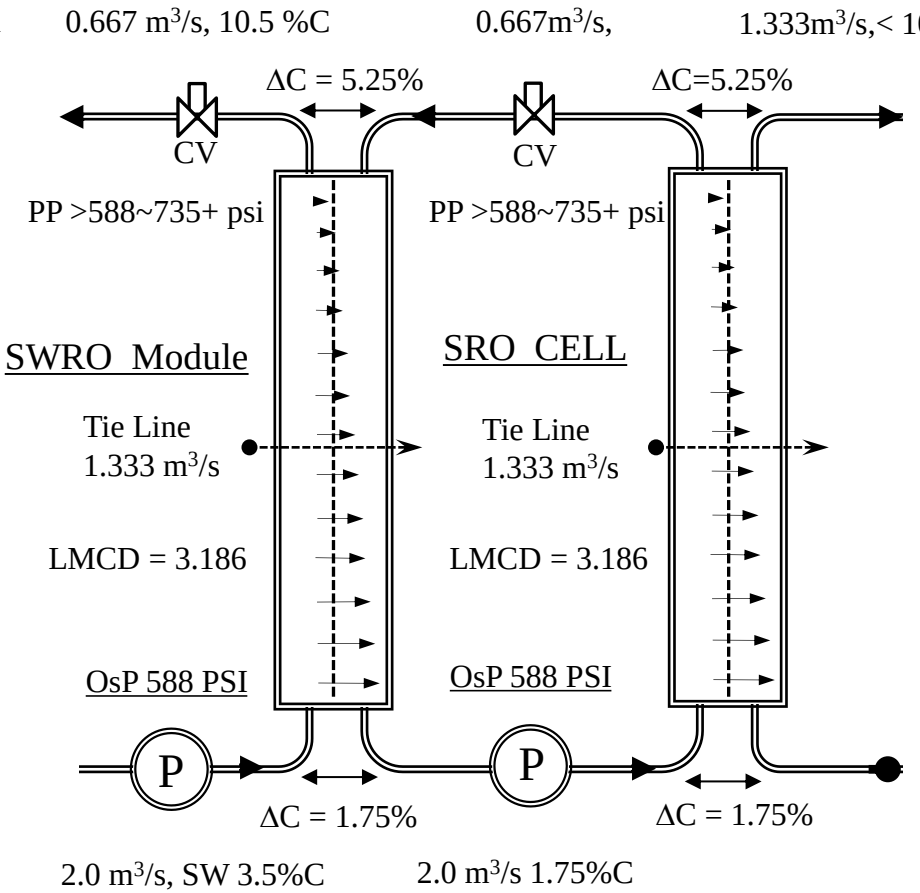


FIG 1b: Seawater symbiotic reverse osmosis [SRO] train of one SWRO module and SRO cell for **67%** water recovery.

FIG 1a,b: The Concept of Seawater Symbiotic Reverse Osmosis [SRO] Desalination

1 m³/s = 264.17 US gal/s is used as a criterion for design.
Other smaller units (liter or cubic foot /sec can be also used)

PX — Pressure Exchanger, Hydraulic Turbine, Relief Valve

Symbiotic Reverse Osmosis [SRO] Process
Inventor: Maher I. Kelada

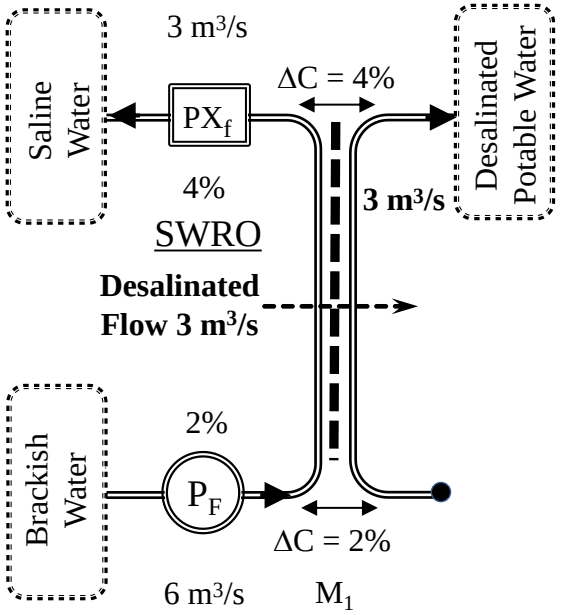


FIG 2a: 2% Brackish Water Desalination for **50%** Recovery at Differential Salinity Concentration of 4% (OsP = 448 PSI) with One RO Module

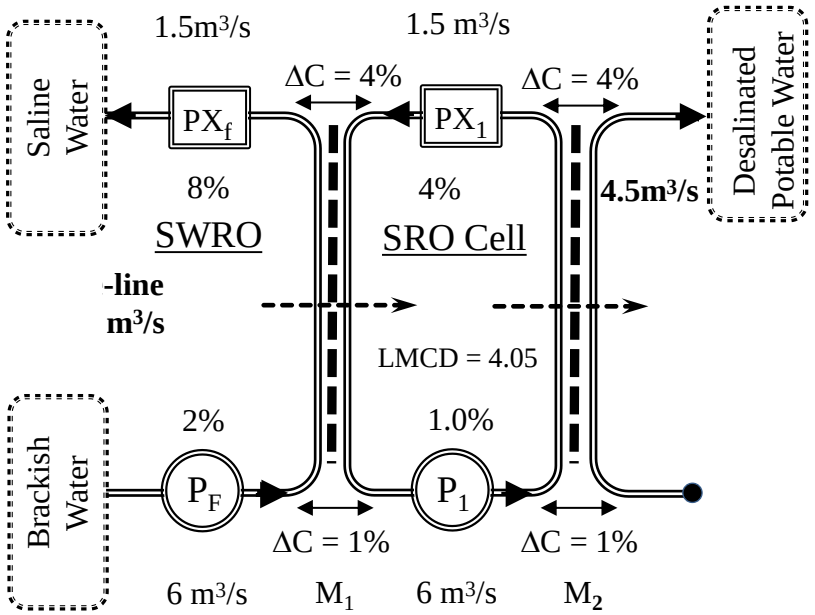
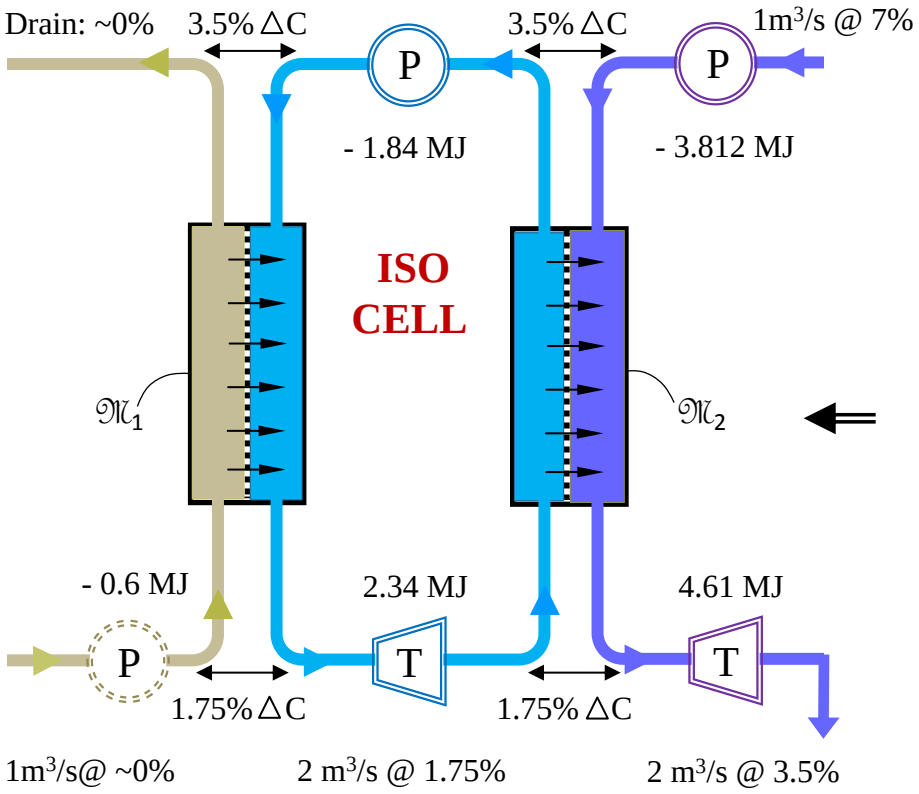


FIG 2b: 2% Brackish Water Desalination for **75%** Recovery at Differential Salinity Concentration of 4% (OsP = 448 PSI) with One SRO Cell

FIG 2a, b: Single Cell [SRO] 2% Brackish water @ 75% Recovery. Number of stages may increase in case of increasing flow recovery, while increasing rejected brine salinity.



Energy Estimation	ISO Cell
Potential energy generation (E) @85%	6.95 MJ
Total pumping energy (PE) @75%	-6.25 MJ
Membranes LMCD:	2.53, 2.53
Net energy generation: (NE)	0.7 MJ
System efficiency NE/E	10%
NE/m³ of brine feed	0.7 MJ

0.7 mega joule = 0.7KW/ liter-sec @ 0.01-7% salinity range

Four Cell Train at 14%ΔC = 3.8KW/liter-sec,

Great Salt Lake ISO Power at 24%ΔC = 16KW/liter-sec,

Qattara, Egypt ISO Power at 31%ΔC = 20KW/liter-sec,

Mauritania, ISO Power at 32%ΔC = 25KW/liter-sec

FIG 3: ISO Power Cycle Simulation

Induced Symbiotic Osmosis [ISO] for Salinity Power Generation

Inventor: Maher I. Kelada

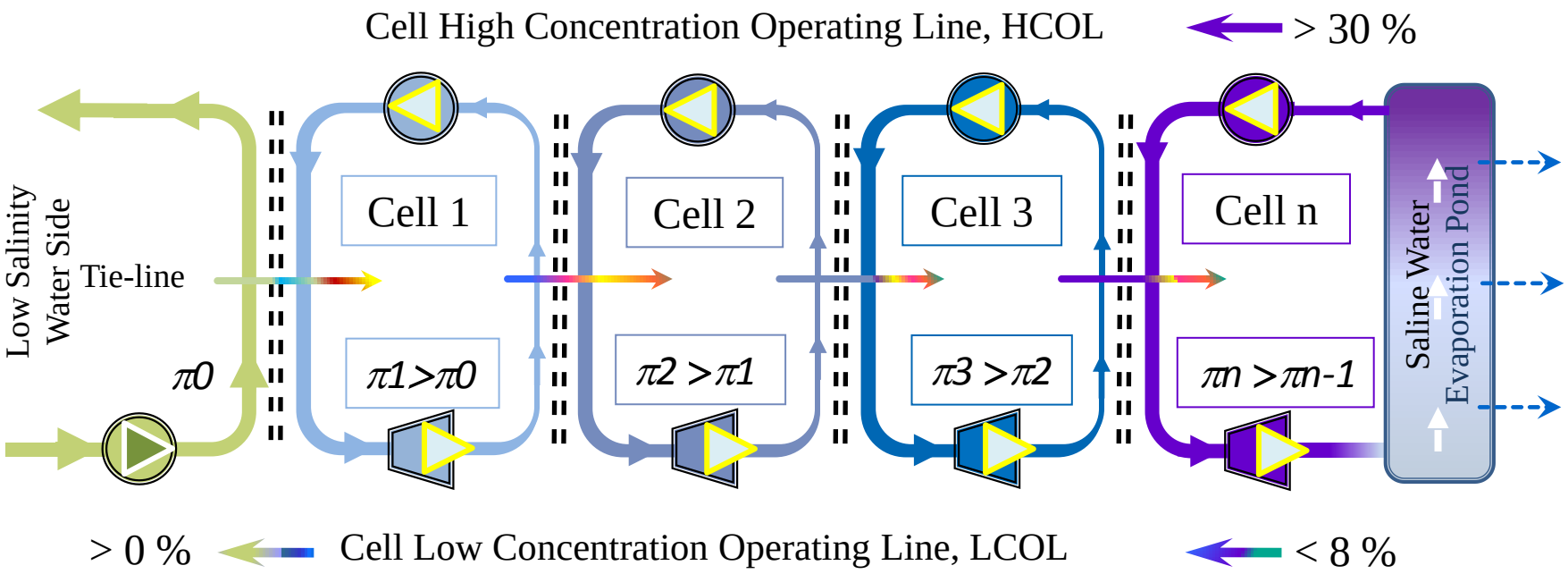


FIG 4: Four ISO Power Cycles For Hypersalinity Water Simulation

MIK Technology
List of Patented and Patent pending Technologies

2.1 Induced Symbiotic Osmosis [ISO] For Power Generation,

2.2 Symbiotic Reverse Osmosis [SRO] For Maximizing Water And Salts Recovery From Saline Waters and Brines,

2.3 Methods Of Making Flat Sheet Membrane Element [FSM],

2.4 Hollow Fiber Membrane Elements [HFM] And Methods For Making Same,

2.5 Symbiotic Fluids Fractionation And Osmotic Process By Flat Sheet Membrane Panels,

2.6 Symbiotic Reverse Osmosis For Maximizing Desalinated Water Recover From Saline Waters and Brines,

2.7 Ecologically Sustainable Hydraulic Fracturing [ES-FRAC] Process And Apparatus,

2.8 PV-CSP-ISOP &ORC Solar Renewable Energy For Day/Night Operation In Harsh Environment,

2.9 Miscellaneous Patented Water Technologies; Countertop Flow Board Water Purification, Waste Water Sequential Dissolved Air Flotation Cascade Ion Exchange Columnar Water Deionization Systems

2.10 Renewable Chemistry Technologies For Bio-agro Chemicals For Manufacturing Fertilizers