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AP1000 Design Certification Amendment

Comment On: NRC-2010-0131-0001
AP1000 Design Certification Amendment

Document: NRC-2010-0131-DRAFT-0028
Comment on FR Doc # 2011-03989

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General Comment

To the Ladies and Gentlemen at NRC and to the Good Peoples of the General Public of the United States of America, I send Greetings. I offer the following comment and request posting/submission to NRC Public Comments Page re NRC-2010-0131 proposed regulation changes as follows. I am part of a team leading advancement of improved safety scenarios at all NRC-regulated facilities under NRC jusrisdiction in view of recent events at Fukuhima-Diachi Power Station Japan which utilize the AP1000 Nuclear Reactor. This recommendation centers upon recommending integration of a pateneted nitrogen-gas assist technology called, CryoRain, along with ability to remotely monitor reactor core components in order to insure improved worker safety and prevent possible reactor core meltdowns as proposed in the following article published on April 13, 2011 and viewable at URL:
http://www.clubdoconline.com/news/press-release/scientists-propose-use-of-cryorainorie-technology-at-great-lakes-and-candu-corridor-nuclear-sites/

Prior to NRC's granting final approval for licensure of the AP1000 units at any current or future Nuclear generation sites in North America, this team is calling for and requestion Congressional Hearing to address the instant, proposed safety upgrade which was demonstrated to be effective in halting the meldown at the Fukushima disaster in Japan. The Nitrogen assist mitigation technology should be given serious consideration for deployment at any and all nuclear sites under US Jurisdiction and should be mandated by Congress for deployment particularly in view of the Fulushima incident. Respectfully Submitted, Dr. Joseph A. Resnick, Professor Emeritus

Attachments

NRC-2010-0131-DRAFT-0028.1: Comment on FR Doc # 2011-03989

Template = SECY-067 **DS 10**

TITLE: **Liquid Nitrogen Enabler**

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ASSIGNED TO: AirWars Defense LP, a Colorado Limited Partnership registered 7/26/02 #20021204951, a small business.

SECTION 3744 Class 62-050.1 PRIOR ART: Searched, but none found relevant.
Examiner: William Doerrler (571) 272-4807; FAX: (571) 273-4807

DATE: May 14, 2003 APPLICATION NUMBER: 10/437,538; USP 20040226301

Background: Nitrogen as a molecule, N_2, comprises 78% of the atmospheric gas throughout the earth. Extreme cooling isolates oxygen, another molecule, O_2, comprising about 21% of atmospheric gas, the process can liquefy either N_2 or O_2. Nitrogen molecular gas is as inert as Helium or other Noble gases, whereas Oxygen molecular gas is explosive, oxidizing anything it contacts. Therefore, in volatile situations, where something is likely to burn or explode, Nitrogen is preferred, even to Noble gases since Noble gases are rare, and thus expensive, compared to Nitrogen. Liquid Nitrogen is stable between -210° and -195.8° Centigrade, mighty cold. Liquid Oxygen is stable between -218.79° and -182.97° Centigrade. Viewing Liquid Nitrogen in a dewar, it looks as clear as water. If one pours it out on a tile or cement floor, droplets of it rise above the floor and skitter in all directions gathering loose dust and dirt. When it is fully evaporated, the dust and dirt are at the spot of its extinction. This use has no function.

The skittering droplets of Liquid Nitrogen happen because the liquid has a very high surface tension making its shape at rest a sagging ball. It rises from the floor, which is warm, because the warmth causes the Liquid Nitrogen to evaporate. This levitation is the result of the jet-like gas production caused by this warming. It is hard to balance on a point to stay in place, so as the drop becomes off-center of the gas jet, it leans in a direction and the gas jet then propels it in that direction as it warms to the temperature of the atmosphere and the floor beneath it. Since Liquid Nitrogen is so very cold, and the gas jet is cold as well, even dirt stuck on the floor freezes and flakes off the floor as it freezes coating the droplet. Since it freezes and reaches the temperature of the Liquid Nitrogen, it can adhere to the cold droplet without causing the liquid around it to gasify or evaporate. Thus, the dirt and dust flow with the droplet at the same speed and essentially polluting the droplet until it is dissipated.

Evaporating it goes from a liquid density of 19.54 pounds per cubic foot to gas at -195.8° C. boiling point at 0.083 pounds per cubic foot, indicating an expansion of 235 times in the process of evaporating and cooling to -147° C. and to 0.078 pounds per cubic foot warming to 17.7° C., an expansion of 250 times the liquid volume. If it enters a fire, there is further expansion as it heats to the burn temperature. Thus, non-fire applications of Liquid Nitrogen would have a liter of Liquid Nitrogen evaporate into 250 liters of molecular Nitrogen gas. The volume change would be from 1 cube unit as Liquid Nitrogen to 6.3 units cubed. In a fire situation, the heat of the fire will expand the gaseous Nitrogen even further. For this reason, it is well to guage the size of the task and use only as much Liquid Nitrogen as needed to "do the job."

To raise the temperature from -195.8° C. to 17.7° C. pulls considerable heat from the region. Thus if the Liquid Nitrogen could be controlled or at least pause in the area where a fire needs controlling long enough to draw the heat energy from the fire, it is hard to sustain the burning. Add to that the inertness of the gas, the fact that a Nitrogen atmosphere will not sustain a fire. Thus there are two components of Liquid Nitrogen, which, when it evaporates, would prevent a fire from continuing to burn.

Another function of the Liquid Nitrogen is the fact that chemical reactions are temperature dependent and can be slowed and even stopped by lowering the temperature. Therefore, it would be most useful to find a means to control the locality of Liquid Nitrogen while it evaporates to concentrate the purity of the Nitrogen atmosphere and the heat loss caused by evaporation of Liquid Nitrogen and its heating to 17.7° C. This patent application addresses this capability.

All work with Liquid Nitrogen here described should be done with breathing air for people and animals supplied if close to the area affected and intake air for combustion engines. Electric motor driven units are not affected by the atmospheric content change.

The Discovery: To slow the flow from the origin of the Liquid Nitrogen, the origin being, for example, the spot where the Liquid Nitrogen goes as it is poured from a dewar, one can use an elevated trough pierced with holes to shower the Liquid Nitrogen down in many narrow streams or drip lines. This will give maximum exposure of the Liquid to warm gases in the atmosphere as it falls causing much of it to gasify. This cools the air, but the burst of the cool, dense Nitrogen gas will push other gases from the location where it is raining Liquid Nitrogen. What does not evaporate hits the surface and will skitter if the surface is smooth and dry. If it is gravel or sand it may dig itself into the ground with its weight and liquidness making the ground extremely cold and effervescent with gaseous Nitrogen boiling to the surface. This both increases the amount of inert Nitrogen gas and lowers the ambient temperature considerably freezing water and attracting frost.

Descriptions of Figures:

Figure 1 - Design of the trough or gutter.

Figure 2 - Nozzle design for varying the number of flow points from a dewar or other Liquid Nitrogen source as a insulated truck or trailer.

Figure 3 - One circular design using multiple curved units and a two-outlet source with applications to surround single point fires of large size.

Figure 4 - Fire quelling in a residence fire at window entry of equipment and Nitrogen dissipation.

Figure 5 - Fire quelling in a slab structure and on floor fires in tall buildings.

Figure 6 - Fire quelling and preventing collapse in vehicle, plane and rocket attacks on buildings by inserting a trough and pouring Liquid Nitrogen into it.

Figure 7 - Shows means to increase pressure in an active tornado using Liquid Nitrogen and questions if it could apply to hurricanes.

Figure 8 - A circular trough design with hydraulic inner leg sections, which expand when in place undercuts and lifts an explosive unit as a bomb or mine.

Figure 9 - Shows hydraulically expandable sections of the legs.

Figure 10 - Shows leg sections hydraulically expanded and Liquid Nitrogen in the trough and raining down to the surface cooling the mine and freezing leg sections.

Figure 11 -Shows the detonation device, now inert, lifted with trough unit and shoveled by undercutting it below the hydraulically inflated leg sections allowing the whole structure including mine to be moved in the Liquid Nitrogen cooled state.

Figure 12 - shows Liquid Nitrogen used to postpone detonation of underground ordinance and saving of the integrity of the system the ordinance was to destroy.

Figure 13 - Lava flow arresting can create a plateau, which can be plumbed for use and in preparation for a dam holding back stream water forming a mountainside lake. *Figure 13a* shows the preparation apparatus. *Figure 13b* shows the lava cooled and covering grid. *Figure 13c* shows resulting area with dam on high side of plateaus with lake. The Lake will stop future lava flows from destroying this area by cooling it.

The Method: One way to apply Liquid Nitrogen to a limited region is to use galvanized gutter material forming a circle if one has a point fire as a burning oil well or chemical volatility that must be diminished as with a mine, an explosive unit that detonates with a touch or touch sequence, or forming linear trough with the circumstance of a raging fire line moving to cross a line that would endanger lives or property. The gutter is pierced with holes at a size as, but not limited to, a quarter inch (1/4") diameter in an area pattern as zigzag so that when the Liquid Nitrogen is poured into the gutter it flows to fill the gutter and leaks out of the holes making an area of raining Liquid Nitrogen flowing onto the ground or surface below. The purpose is to expose the Liquid Nitrogen to generate the most gaseous Nitrogen and produce the greatest cooling.

Figure 1 shows the design of the trough or gutter with *Figure 1a* representing a cross section of the trough (**1**) showing a spike (**2**), which enters the ground leaving a gap between the surface (**4**) and the gutter outer skin (**3**) at the height needed to make the raining Liquid Nitrogen evaporate most efficiently for the particular application. The roll or core edge (**5**) gives the trough strength to retain its shape during use. *Figure 1b*, the top view, shows the holes (**6**) are patterned (**7**) to give a thickness to the rain of Liquid Nitrogen. *Figure 1c*, the side view, shows the trough with the holes (**6**) on the side showing and the spikes (**2**) with the selected distance between the surface (**4**) and the outer skin (**3**) of the trough. The roll or core edge (**5**) stiffens the trough structure.

In practice, the trough would be leveled such that the end or part of the structure where the Liquid Nitrogen Source pours into is the highest and, with gradual slope, the final or end of flow section is the lowest. The dewar can be the source outlet for a straight trough as for stopping the circular airflow and burning of the leading edge of a forest fire. The dewar with a "T" nozzle is recommended for a circular trough where the base of the "T" is sealed to the dewar and the two ends of the top of the "T" pour the Liquid Nitrogen out into the trough in both directions at once.

Figure 2 shows this configuration with the dewar (**10**) having the "T" (**8**) base (**8a**) sealed to the dewar outlet (**10a**) and the two ends of the top of the "T", (**8b** and **8c**) form the outlets for the Liquid Nitrogen (**9**).

Figure 3 shows a three unit circular ring (**1a**, **1b**, **1c**) as might be used for encircling a well fire (**20**). The dewar (**10**) with a "T" nozzle (**8**) pours Liquid Nitrogen in both directions into the circular trough (**1**) flowing from the highpoint (**12**) where the Liquid Nitrogen (**9**) is introduced, to the opposite side of the circle (**13**) where the Nitrogen (**9**) flows while leaking through the holes (**6**) and raining down on the ground in a wide line (**7**) on the surface surrounding the fire. The dynamics of fire convection is that the heat of the fire heats the air above and radiating out from the fire, while the air near the ground is cooler and drawn into the fire, heated and flows upward pulling more cool ground air toward the fire making a rolling action surrounding the point of the fire.

Figure 3a shows how to optimize the trough height in fire conditions. The wind input draft **(30)** has a height limit which is determined by a wind pole **(31)** with light weight fabric strips tied around it with long ends left to blow in the wind. The strips above this draft **(32)** are limp, whereas the strips in the draft **(33)** extend out in the direction of the wind flow. The break height between strips **(32)** and **(33)** is the optimum height of the stakes **(2)** holding the trough in place. This is the height of the stakes used in *Figure 3* apparatus where the nitrogen **(9)** pours from the trough **(1)** through this flow which super cools the air and floods it with nitrogen gas faster than it can be drawn into the fire. This disrupts the wind draft by becoming the gas source; cools it, thus reducing the fire energy; and floods the space of the fire with Nitrogen stopping the burning.

Figure 4 shows the use of the wind pole **(31)** in treating a house fire to determine if the window, which was opened by whatever means including breaking the glass is in the fire draw. If, when the window is opened, the strips go from pointing down **(32)** to blown horizontal **(33)**, that window can be used for the Liquid Nitrogen treatment. If not, try another window until you find one that becomes the air intake for the fire. Place a half-circular pan **(11)** inside the window **(14)** with stakes **(2)** that attach to the pan rim **(5)** and rest on the windowsill **(15)** and pouring receptacle **(11a)** outside the window so Liquid Nitrogen **(9)** can be poured into the pan **(11)** from outside. The pan **(11)** has holes **(6)** in a pattern **(7)** that allow the Liquid Nitrogen **(9)** to shower down to the floor **(4)** past the window **(14)** with a wide path **(7)** for the draft to pass through the Liquid Nitrogen streams before it goes to the fire. Shortly, the Wind pole **(31)** ties will all droop **(32)** because the pull of air to the fire is coming from the Nitrogen gas **(9)** coming from the streams of Liquid Nitrogen rather than the air from outside the window. When the Nitrogen is gone and the draft does not start again, the fire is out. This is a quick process. Immediately rescuers wearing air tank breathing apparatus and carrying extra oxygen rich air tank breathing equipment should enter the building to find people or animals in the building. Once they have the breathing equipment in place, artificial respiration may be needed to resuscitate those in the fire since the Nitrogen atmosphere can render them unconscious. This must be done immediately. The procedure prevents much of the burning of those rescued had this technique not been used to quickly quell the fire.

Figure 5 illustrates fires in slab building structures or floor isolated fires in tall buildings, the strip trough method should be used which is recommended above for stopping the leading edge of a forest or grass fire. The trough with a center Liquid Nitrogen pouring location (**12**) should be set up in the central hall with an entry of the dewar tube from the storage dewar or tank truck (**10**). The "T" configuration of the tube end (**8**) is required so Liquid Nitrogen pours in both directions into the trough. The level of the trough should be highest at the Liquid Nitrogen entry (**12**) and slant, say one inch per foot of trough, to the ends (**13**). Stakes (**2**) need to be planted in flag stand type boots so the trough does not fall down with the flow of Liquid Nitrogen. Seal the entry of the dewar tube to prevent air from entering. Start the Nitrogen flow. The raised trough with holes (**6**) in patterns (**7**) will let the Nitrogen drop through the holes so it will evaporate into super cool air during the fall. The Liquid Nitrogen left hitting the floor will skitter all over the floor distributing the Nitrogen to all parts of that floor of the building, and, where there are passages as stairwells and elevator shafts, to other floors of the building. After the prescribed amount of Nitrogen, say a barrel a foot of trough plus a barrel per two to five linear feet of floor space beyond that depending on the volume of that floor of the building. This will flood the floor, floor to ceiling with Nitrogen gas stopping the burn and markedly cooling the air and physical structure. Once applied, again get rescuers into the area wearing air tank breathing apparatus and carrying oxygen rich air tank breathing equipment for those found, resuscitating those who have stopped breathing immediately at the place they are found. Keeping the breathing with equipment over the nose and mouth of those needing rescue, move them or help them walk to safety.

Figure 6 illustrates the case of an assault on a building with an external vehicle, truck, aircraft, rocket, one can deliver a trough, say 200 feet long, made of, for example, 33-foot sections with the sixty six feet closest to the building having patterned **(7)** holes **(6)** and an open end **(13-16)**, and the other end having a closed end **(12-17)**. If on the ground floor this can be carried into the burning building **(21)** on a truck bed and rammed in the pathway under or aside the attack vehicle **(22)**. If an airborne missile, rocket or plane **(22)**, hit the building and lodged inside, two helicopters will raise the assembled trough **(1)** to the proper height to match the entry and then fly towards the building from above the roof level sliding the trough in along the side of the plane, not in through the fuselage. The ties to the trough for the helicopter closest to the building **(24)** should be just building-side of the center so it puts some weight on the outside end. This strap is released to the roof to be tied around the elevator shack or other secure roof feature. Those on the roof should tie it securely. The outer helicopter **(25)** has two straps around the end area of the trough. It lets one fall onto the roof, which is secured to the looped feature as the outer end is lifted **(12)** to insure that the Liquid Nitrogen **(9)** will flow into the building down the trough **(13)**, and then the second strap is released to again hook into and be tied securely to the roof feature.

Then the helicopters pick up dewars **(10)** of Liquid Nitrogen **(9)** with a dropped dewar tube **(10a)** to allow flow of Liquid Nitrogen into the trough outside the building and flowing down the trough raining Liquid Nitrogen from the inside end of the trough with patterned holes **(6)** and with any remaining in the trough flowing across the floor cooling and evaporating as it goes. This will oxygen-starve the fire, even of jet fuel, and cool the building structures from the "hot floor." To supplement the cooling and increase the Nitrogen affect on fire elsewhere in the building, like burning fuel running down the elevator shaft, dewars **(10)** of Liquid Nitrogen that empty into a round pan **(1)** affixed to the dewar **(10)**, with patterns **(7)** of holes **(6)** will give the fastest dispersal of Nitrogen gas and greatest cooling rate for the interior structural units of the building preventing the meltdown that occurred when the World Trade Center was attacked by two airliners on September 11, 2001. This method, if applied quickly, may have prevented the collapse of the buildings by stopping the petroleum burn and cooling the entire structure. To save the people traveling in the stairwells, buffers, like a row of sandbags, should encircle the entrance to the stairwell so the Nitrogen gas does not asphyxiate those using these escape routes. Rescuers wearing air tank breathing apparatus, again should enter the fire area with oxygen rich air tank equipment to rescue survivors. The fire put out this quickly will save the people from further burning, but precaution must be taken to not re-ignite remaining jet fuel or other fire fueling substances. Centers of beams, external metal and other hot places can ignite the fuel if it contacts these spots. Vacuuming up explosive liquids as quickly as possible can prevent this re-ignition.

This illustrates the purpose of this technology for fire control.

Figure 7 shows this same concept of shower application of Liquid Nitrogen **(9)** can be applied to dissipating tornados. Having a cargo plane carrying one or more trailer dewars **(10)** of Liquid Nitrogen **(9)** with dispersion dewar tubes **(10a)** leading to a sprinkler head nozzle **(8)**, they can fly to the clouds suspected of producing tornados because of the buildup of extremely low atmospheric pressure and unload the Liquid Nitrogen **(9)** which, as it cools, evaporates into about 250 times is liquid volume. The cooling may exacerbate the hail from the clouds, but it should increase the air-pressure in the cells that create the twisters. This is the same concept as putting the Liquid Nitrogen in the rolling, leading edge of an advancing fire to stop the destructive airflow pattern. The volume of Liquid Nitrogen needed for hurricane taming needs to be calculated and hail increase figured before this method can apply in this circumstance.

Figure 8 starts a series of illustration to stop the explosion of ordinance needing to be cleared. A small circle surrounding a mine in the dirt or sand can be made before removing it from its location. A trough **(1)** the same size with slit holes **(6)** so the Liquid Nitrogen pours down faster than for fire applications since the preferred function of the Liquid Nitrogen here is cooling the mine to make the explosive material inert long enough to move the mine **(26)** from its location to a detonation chamber. This unit has a second feature, double sectioned legs **(27)** with a structural support section **(28)** on the outside and an inflatable inner section **(29)**. This figure shows the top view of the mine with the cap on top defined.

Figure 9 shows this inner leg section **(29)** filled hydraulically with water or oil expanding it in the lower section to extend from the leg **(28)** to under the mine **(26)** allowing the mine to be lifted from the surface **(4)** a small distance. The mine **(26)** is shown in *Figure 9a*. *Figure 9b* shows the expanded hydraulic section **(29)** from the front and side. *Figure 9c* shows the trough unit **(1)** in side view with the leg sections **(29)** expanded to slide under the mine. *Figure 9d* shows the structure, bottom view, from the surface looking up with the leg sections **(29)** extending under the mine **(26)** in equal spaced segments enabling the whole unit, trough and mine, to be lifted once the whole area is Liquid Nitrogen cooled.

Figure 10 shows the mine cooling trough **(1)** with the mine **(26)** cooled by the Liquid Nitrogen **(9)** here being poured into the trough with a single nozzle dewar **(8)**. A

"T" nozzle would be used on a larger circular trough or where linear troughs are applied and the Liquid Nitrogen is brought in at a center location rather than from one end. With the Liquid Nitrogen (**9**) poured in, it fills the trough (**1**) and flows from the holes (**6**). One would keep the flow going at a rate that retains the Liquid Nitrogen in the trough, yet not overflowing its gunnels (**5**), the rolled or core edge, though it will splash over as the Liquid Nitrogen is introduced to the warm trough. This splashing will slow as the trough reaches Liquid Nitrogen temperature. The inner leg (**29**) components flooded with oil or water become rock-hard with cooled to below freezing temperatures enabling the tough-mine unit to be transported with the mine held in place by the inflated units (**29**).

Figure 11 shows the next step in the mine (**26**) transfer. Once cooled to near Liquid Nitrogen temperature, the mine becomes inert and can be shoveled from its location and placed in a detonation chamber. A proper robotic design will have a lifting device (**19**) as this hook unit serves and a shoveling (**18**) unit with attachments to the carrying device (**38**) to allow the shovel to be pushed under the trough (**1**) and mine (**26**) lifting these as a unit. The lift will separate the trough and mine unit from the surface (**4**) either at the surface or at the depth where the ground is not frozen solid.

The mine removal method can save life and limb and tools, which are ruined by explosions. It can be used on big pot mines as the Iraqi's left on the bridge over the Tigris River in April 2003 during the Iraq War, or the small Pop Mines buried shallow in the ground. Once a mine is found, this technique will make its removal safer protecting those doing this tenuous job. During this work, one must supply breathing air for those working directly at the scene of Liquid Nitrogen use and for combustion engines.

To extend the application of the inertness of the explosive in an ordinance device when cooled, the transport of these un-detonated units can be done safely if they are retained at Liquid Nitrogen temperatures as putting them in Liquid Nitrogen or in a trailer cooled and maintained at Liquid Nitrogen temperature until it is stored or exploded.

For point-fire control, as putting out the fire in oil well-fires or even surrounding a burning storage tank of petroleum or other combustible material, the large, multi-unit trough is chosen with smaller holes so the longer track of the trough filled with a "T" nozzle can be flooded around the whole circumference with a reasonable volume and flow rate of Liquid Nitrogen.

Predicted Liquid Nitrogen volumes to realize the goal of these techniques are a liter or two of Liquid Nitrogen for the mine cooling technique and about a barrel or two of Liquid Nitrogen for quelling a well fire. For a huge storage tank, a barrel for every ten feet of circumference will probably quell the blaze and lower the temperature of the flammable liquid or solid so it will not readily re-ignite. Linear applications can use a barrel every ten feet to have a Nitrogen gas volume sufficient to extinguish the leading edge of a forest fire stopping its progress.

Figure 12 shows another use of Liquid Nitrogen in this discovery, with detonators (**21**) deep in the ground as with oil wells in northern Iraq, which have detonators 20' below the surface. Using a dewar pipe (**10a**) formed inside a drill bit (**10b**) long enough to probe near the detonator, one sprays Liquid Nitrogen at the level of the detonator to freeze it solid and cool the immediate vicinity to Liquid Nitrogen temperatures. Retaining the explosives at Liquid Nitrogen temperature, dig to the frozen volume and remove the whole section while cold. If the explosive is tied to the well pipe (**34**), a water cutter (**37**) directed parallel to the pipe at the pipe outer skin cuts the explosive loose. Also if the pipe is banded to hold the explosive against it, the water cutter can be directed to cut in a path from the pipe wall outward on the side of the pipe away from the explosives. One swipe downward next to the pipe wall will cut the band. The water cutter can also be used to cut away a segment of the oil well pipe to be removed with the explosive since the oil in the pipe just below the cooled section is solid, cooled by the Liquid Nitrogen. In that case, after the explosive chunk is brought up, the drill pipe should remain in place keeping the oil in the remaining pipeline solid until the petroleum engineers can have it plumbed back into the repaired wellhead. Before the oil is allowed to warm up to flow, the reconstructed wellhead must be in place and the valve closed preventing oil flow. The valve can be opened when the pipeline system is ready to transport the oil.

Figure 13 shows how the cooling effect of Liquid Nitrogen can control the lava flow in volcanos or any other uncontrolled flow of material, even water in a flood or a mudslide. A threatening lava flow can be stopped. It also can be part of planned construction in the place it cools. One places the straight trough (**1**) with patterned holes defining the stop line for the width of the lava flow (**35**). Pouring in the Liquid Nitrogen (**9**) will cause the rain of the Liquid Nitrogen cooling the flow into rock and the nitrogen gas atmosphere will prevent burning of vegetation and structures. Were there time to prepare an area for the approaching lava flow, a grid (**36**), forming a level horizontal plane, can be laid across the flow path with air vents (**36a**) at intersections in the grid going upward an long enough to be above the lava rock level expected, and end points in the grid with extended pipe (**36c**) beyond the expected lava rock volume will have temporary ends of either the funnels (**36b**) for pouring in the Liquid Nitrogen or with temporary air vents again at the height of other air vents. Pipe diameters should be such that whatever use these tunneling pipes are to be put to can be done, as water, electric, telephone and sewage lines. A second level grid, same as the first, can be placed to catch overflow of lava to make a second tier. After that, the flow stopping trough delivery of Liquid Nitrogen is used.

As the lava (**35**) approaches, the grid pipes should be filled with Liquid Nitrogen so the pipes are cold enough to solidify lava around them into solid rock. If the integrity of the grid is lost, the lava will continue its flow and the grid pipes will melt into the flow. Thus it is important to retain the Liquid Nitrogen availability for this process to work. Once rock has formed around the pipes and the lava flow stopped, a dam (**39**) can be built on the upward side to hold back water flowing down the mountain as a stream making a lake. Later eruptions may have lava flow in the direction of this plateau rock and lake (**40**), but it should stop as it enters the lake, being cooled by the lake water.

Therefore I claim:

Cancel claims **1 - 57**.

58. Means of dispensing Liquid Nitrogen to enable its effectiveness against many events caused by nature, accident, or malicious intent, which need curtailing for safety and property preservation.

59. The method, according to Claim **58**, using a spaced hole sieve produces a field of Liquid Nitrogen in drops forming a Nitrogen gas cloud at low temperature originating below the sieve location.

60. The method, according to Claim **59**, using the spaced-hole sieve at or slightly above the fire draft into the fire height floods the fire at the draft with cold, inert gaseous Nitrogen.

61. The method, according to Claim **60**, using the spaced-hole sieve at or above the fire draft height, in troughs surrounding a large fire, and having the fire draft blocked by solid materials to the fire draft height at obstructions to surrounding the fire, applying Liquid Nitrogen to contain the fire and to quell the burn.

62. The method, according to Claim **59**, using the spaced-hole sieve inside the building at a single, external wall location in a building, as a house, upon application of Liquid Nitrogen to flood the entire structure with Nitrogen gas, to extinguish a fire, to put down personnel and chemical explosions in a suspected Methanphenamine lab or hostage crisis.

63. The method, according to Claim **59**, using a closed pipe or solid trough to feed Liquid Nitrogen to the spaced-hole sieve as a long trough to rapidly flood a single story structure as a floor of a tall building, warehouse, or office structure with Nitrogen gas to contain a fire or other crisis.

64. The method, according to Claim **59**, using a portable spaced-hole sieve to apply Liquid Nitrogen directly on the crisis-causing agent as small fire stopping the burn, broken pipe, spewing canister or aerosole can preventing further release of its contents, solidify organic materials spilled on water or the ground solidifying or gelling it for efficient pickup, ordnance as landmine or Experiemental Ordnance Device (EOD) delaying its explosion.

65. The method, according to Claim **58**, using thermal conductive solid walled tubing, cools water to ice and other liquids, including lava and petroleum products, to solids or gels on the tubing surface and, if in a lattice, throughout the inter-tube structure.

66. The method, according to Claim **65**, using thermal conductive tubing, where one pre-empts a crisis by placing the matrix of conductive tubing before the crisis, and when crisis is predicted as imminent, applying the Liquid Nitrogen to freeze the structure in time for it to be effective in the crisis.

67. The method, according to Claim **65**, using thermal conductive solid walled tubing, one can plan the structure of the cooled material by designing the matrix form of the tubing so as to make a post-lava flow area useful or an ice structure sufficient in width and depth to serve as a dam against flooding water torrents.

68. The method, according to Claim **58**, using a crop-duster type dispersion device from an aircraft allows inserting a significant volume of Liquid Nitrogen into a weather system that threatens to create tornados by disrupting its pattern of formation and air currents by adding molecules to raise the barometric pressure and providing coldness to infuse temperature change to prevent or delay or disrupt funnel cloud formation.

69. The method, according to Claim **58**, using a hollowed drill bit enables feeding Liquid Nitrogen to the underground spot where the cold and inert gas is needed insuring the hole to the location is open and intact.

Summary: This invention is a means to quell uncontrolled fires, dissipate low-pressure cells in tornado-producing clouds and make ordinance as mines, old bombs and the like inert and provide a design opportunity for lava flows. For each operation, one applies unique means of distribution of Liquid Nitrogen, either above the surface sufficiently to allow it to rain down from holes in a trough forming a pattern in the bottom of an encircling or linear trough held up with stakes or legs of a length optimum for maximum evaporation before hitting the surface, or underground with drilling means or preparatory piping or well placed air drops of Liquid Nitrogen. This produces local cooling and expansion of inert gas supplanting the general atmosphere with a nitrogen atmosphere reducing significantly the amount of oxygen available and increasing the atmospheric pressure. Both cooling and flooding with inert gas quickly quell of fires. The expansion of gas sprayed in tornado-producing clouds raises the atmospheric pressure. Cooling renders inert fused ordinance as mines and bombs. They cannot explode or detonate at these extremely low temperatures. Liquid Nitrogen can control both lava flows and flooding making the flowing liquid a solid by lowering its temperature.

Declaration: I, Denyse Claire DuBrucq, am the sole inventor of the technology of the patent application, 10/437,538 filed May 14, 2003, titled, LIQUID NITROGEN ENABLER. I am a United States Citizen residing in Milwaukee, Wisconsin USA with correspondence address of P. O. Box 26292, Wauwatosa WI 53226-0292.

The patent has 13 figures and 12 claims, of which six are independent and six dependent.

________________________ _______________________________________

date

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Figure 1

Figure 1a Figure 1b Figure 1c

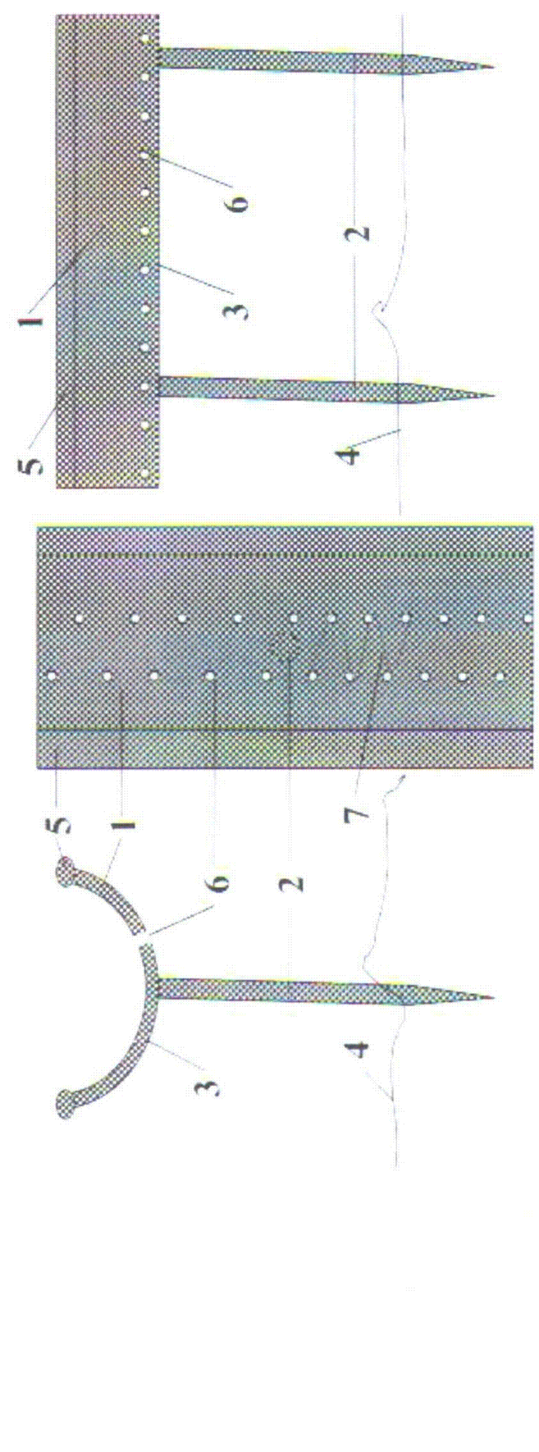
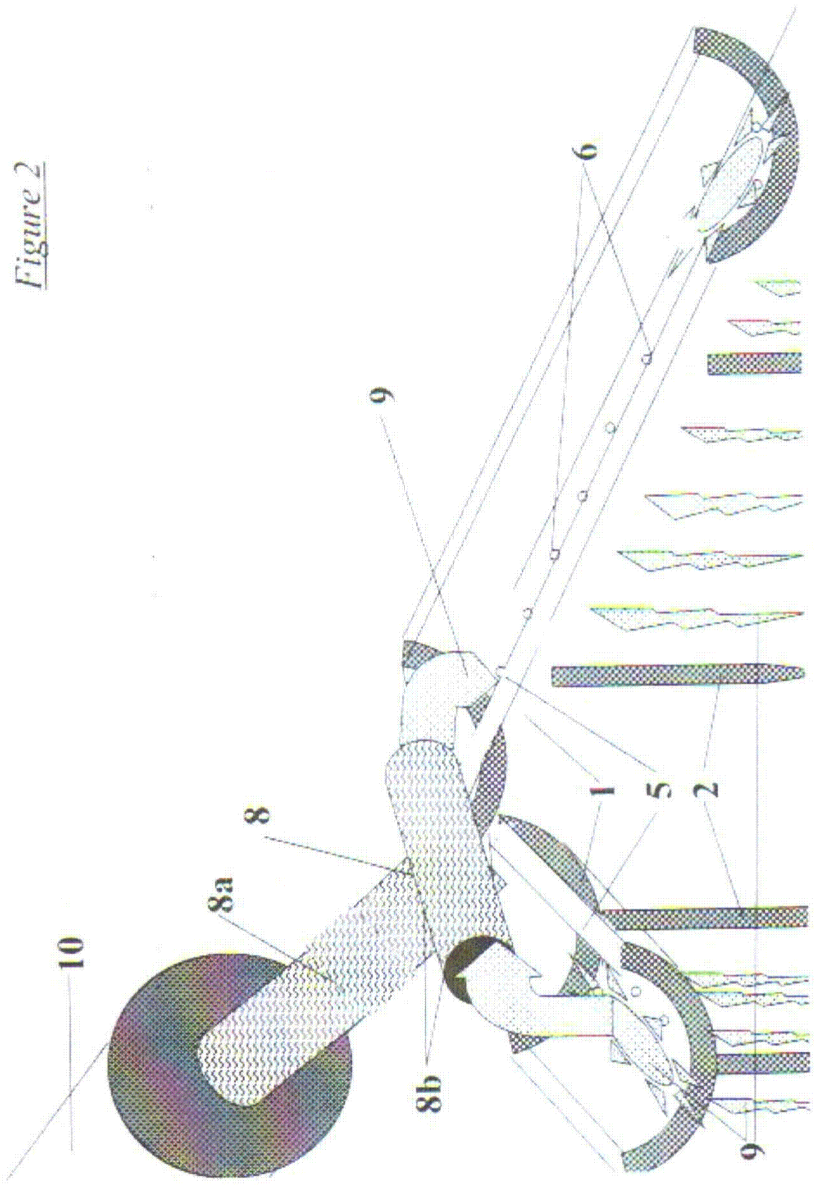


Figure 2



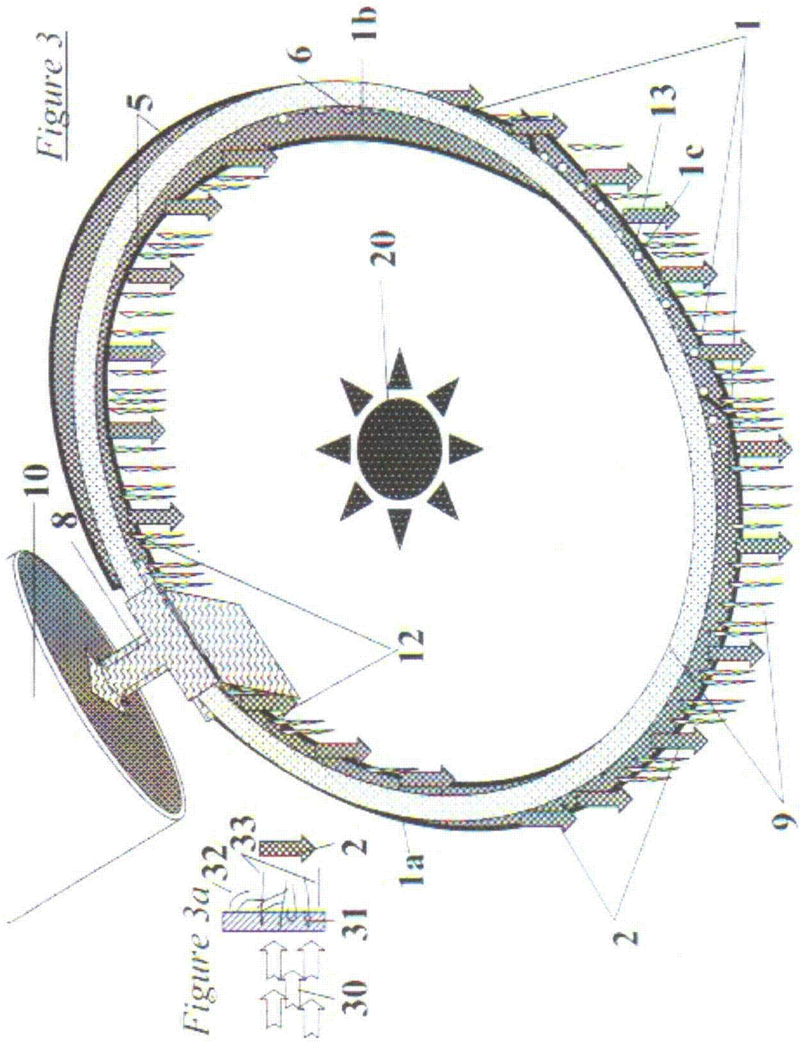
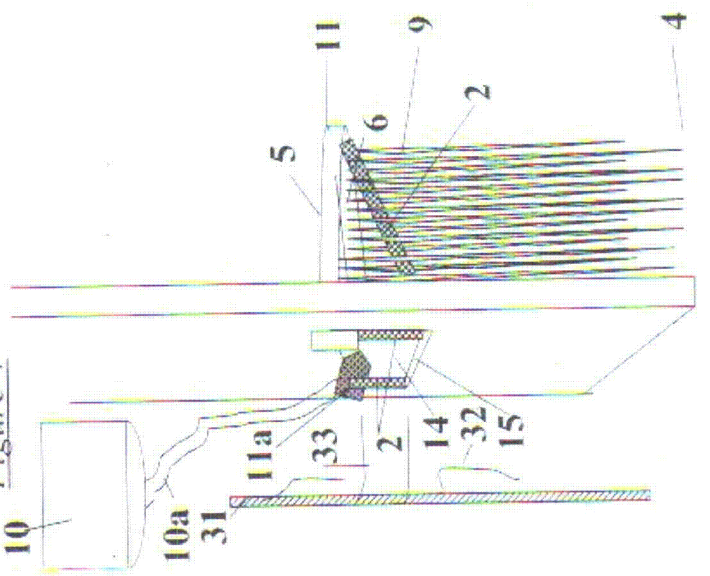


Figure 3

Figure 3a

Figure 4



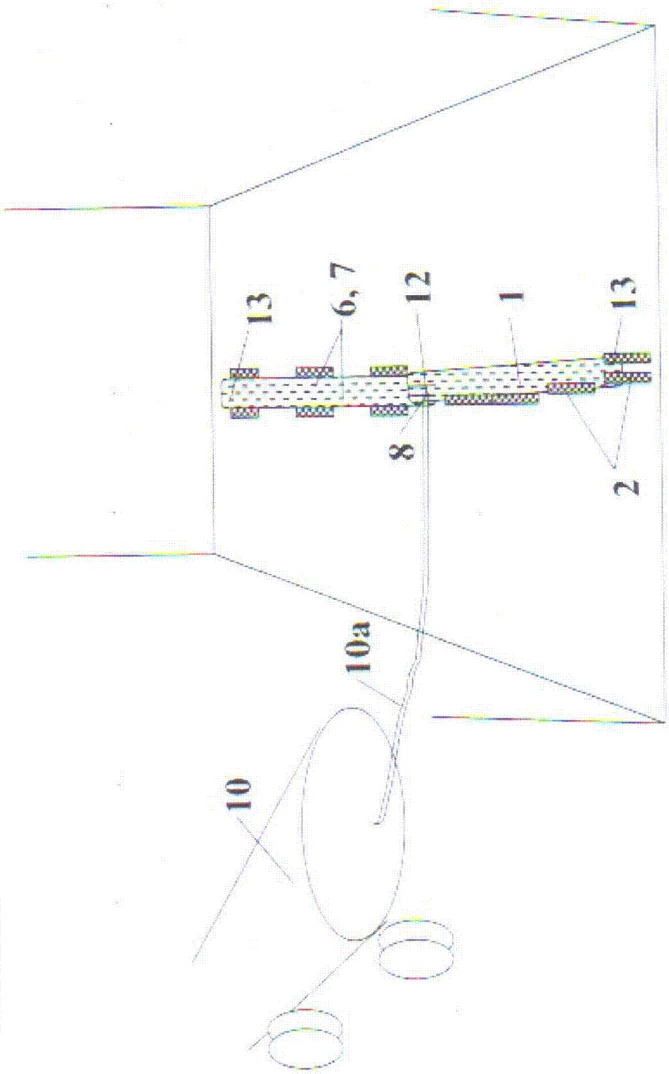


Figure 5

Denyse DuBrucq   Liquid Nitrogen Enabler   10/437,538   May 14, 2003   Page 30

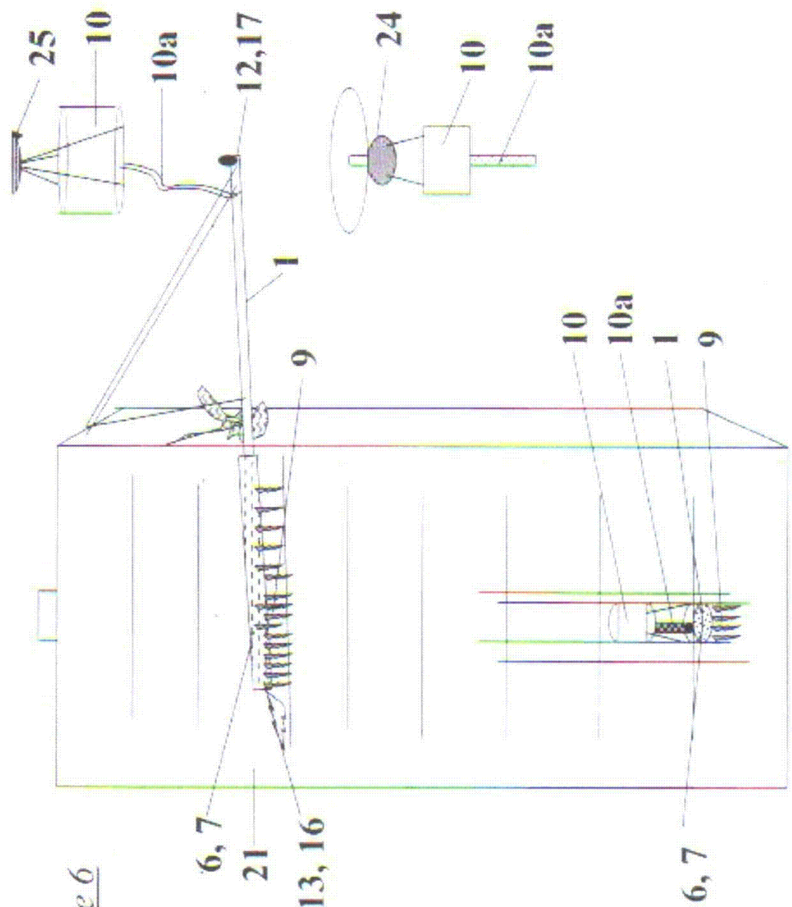


Figure 6

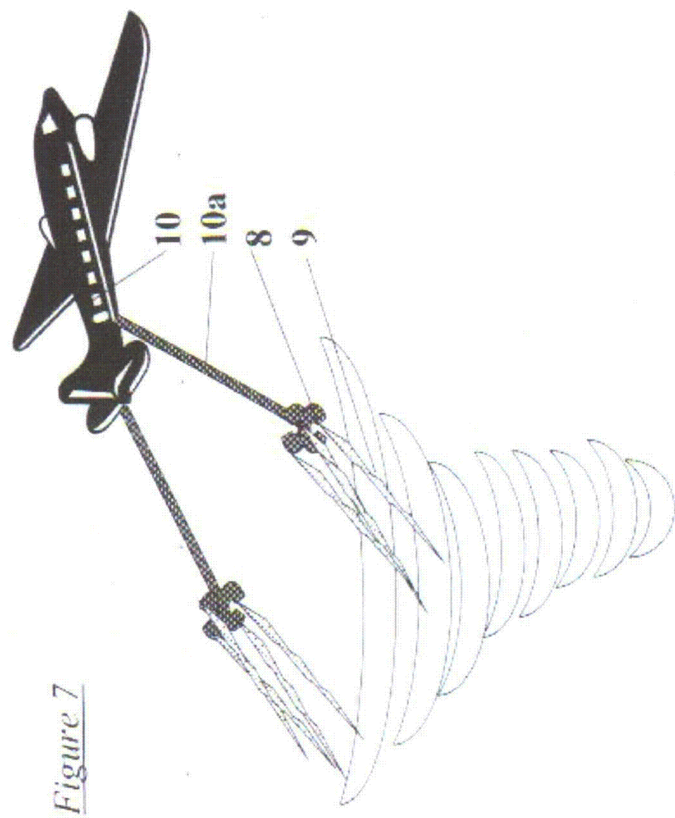


Figure 7

Denyse DuBrucq Liquid Nitrogen Enabler 10/437,538 May 14, 2003 Page 32

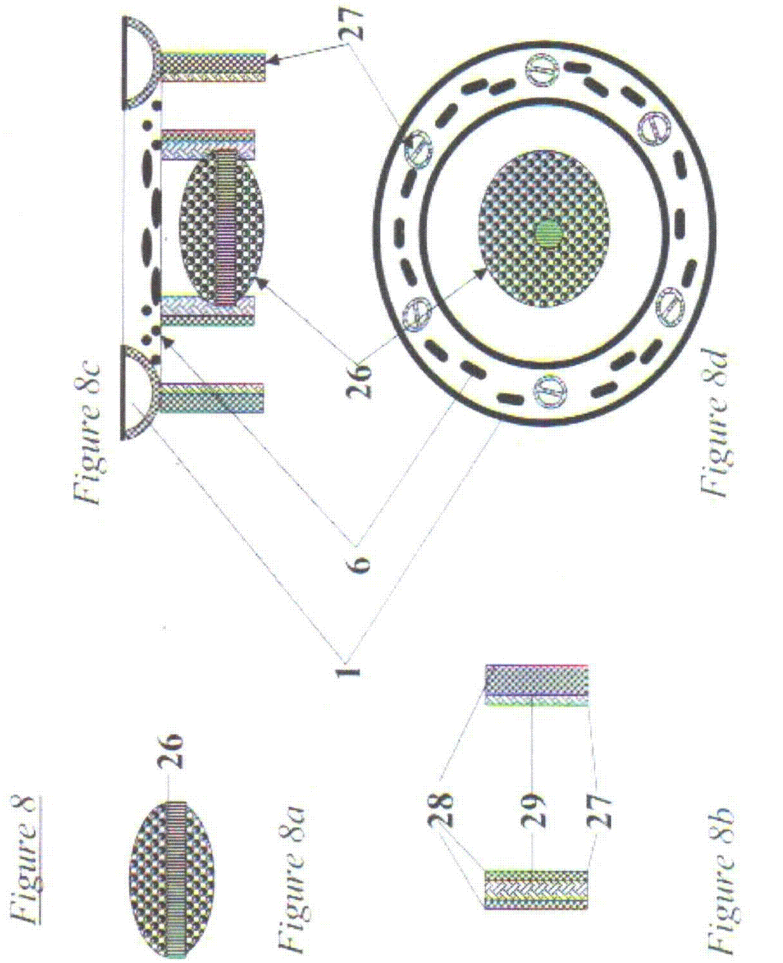


Figure 9

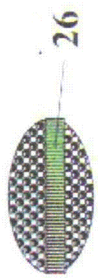


Figure 9a

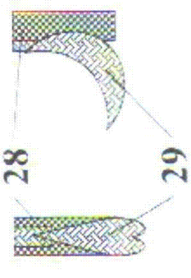


Figure 9b

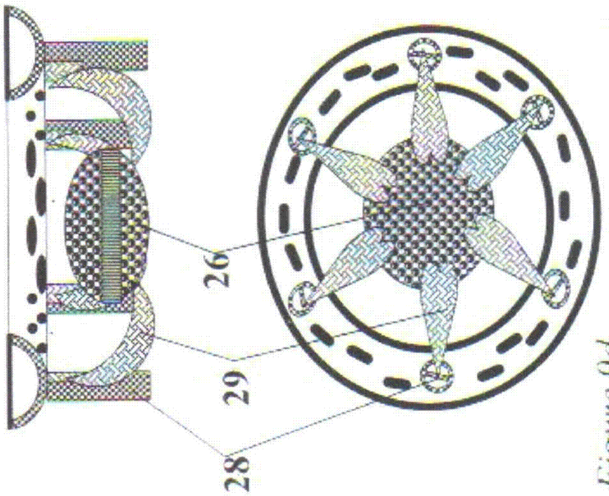


Figure 9c

Figure 9d

Denyse DuBrucq Liquid Nitrogen Enabler 10/437,538 May 14, 2003 Page 34

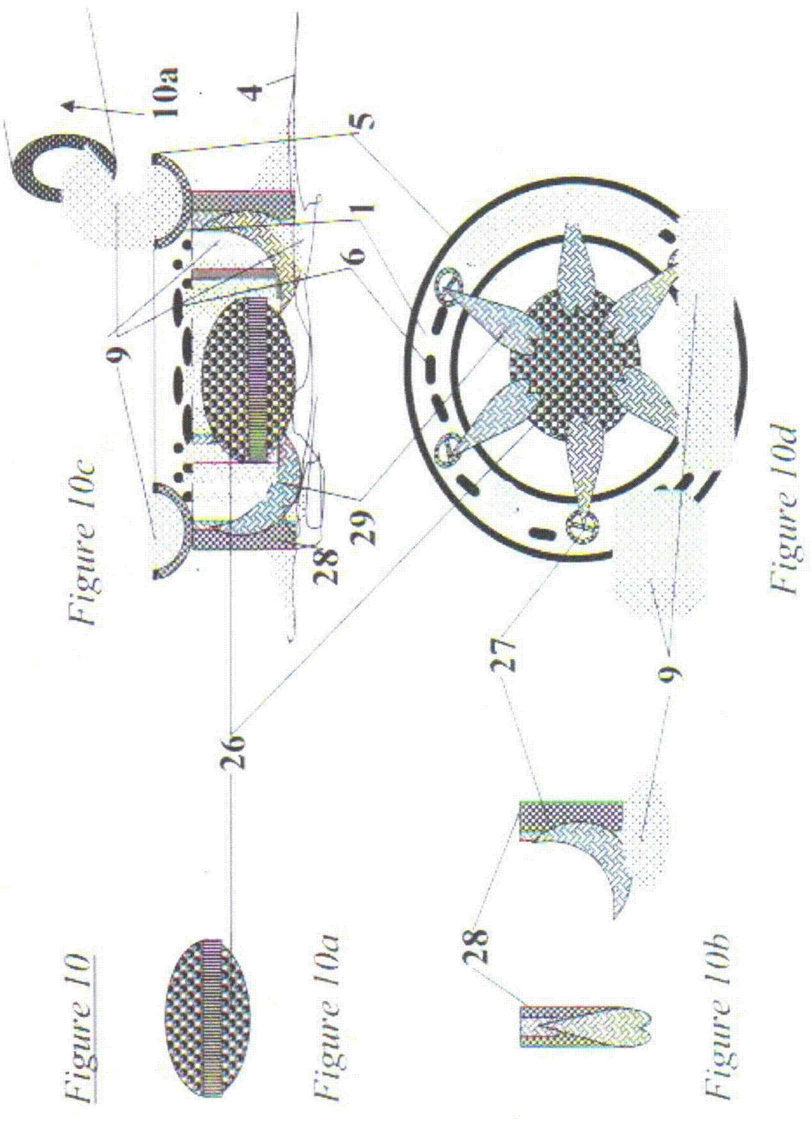


Figure 10

Figure 10a

Figure 10b

Figure 10c

Figure 10d

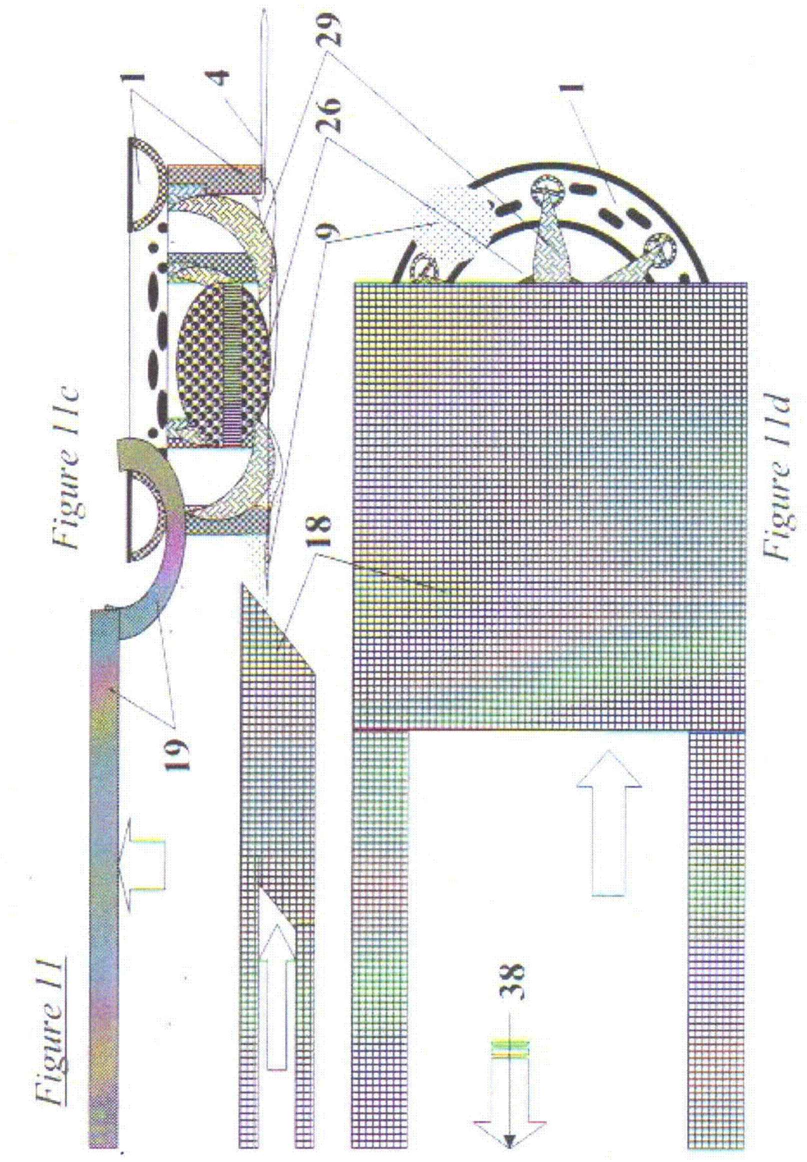


Figure 11
Figure 11c
Figure 11d
1
4
29
26
9
1
18
19
38

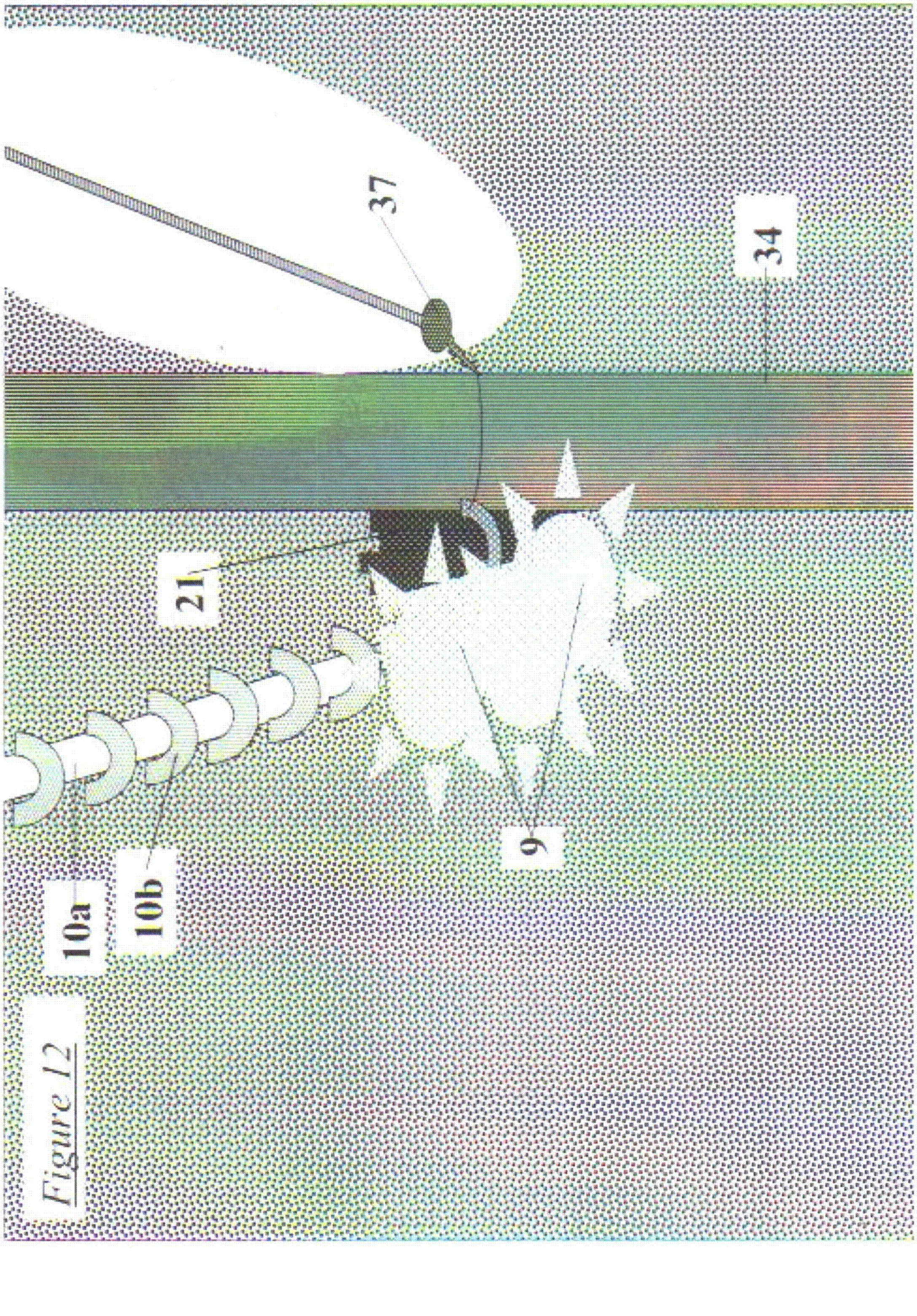


Figure 12

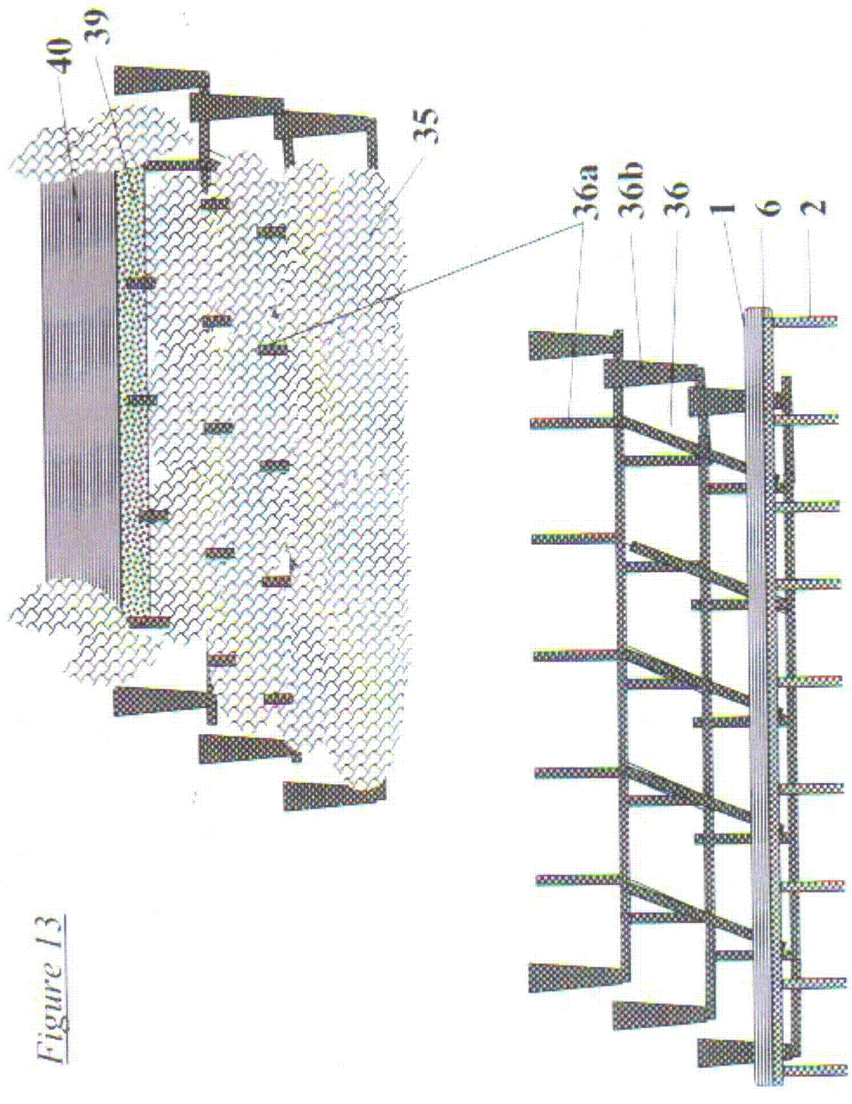


Figure 13

Rulemaking Comments

From: Gallagher, Carol
Sent: Monday, May 09, 2011 3:05 PM
To: Rulemaking Comments
Subject: Comment on Proposed Rule - AP1000 Design Certification Amendment
Attachments: NRC-2010-0131-DRAFT-0028.pdf

Van,

Attached for docketing is a comment from Joseph Resnick on the above noted proposed rule (3150-AI81; 76 FR 10269) that I received via the regulations.gov website on 5/9/11.

Thanks,
Carol