The Solution:
Elimination of Legionnaire’s Disease
From Planet Earth
With the Involvement of All Industries
Legionnaire’s Disease

Elimination, Prevention and Extention of a Healthier Life Span*

*At a much lower cost.

Significant Health Issues - Every Day

Legionella, the bacteria including species that cause Legionellosis, or Legionnaire’s disease, most notably L, pneumophila, or Mycobacterium avium. The various Legionella species are the cause of Legionnaire’s disease in humans and transmission is via aerosols – the inhalation of mist droplets containing the bacteria. The common sources of Legionella include cooling towers used in open recirculation and evaporative cooling water systems, domestic and industrial hot water systems, Waste water treatment plants, and similar disseminators that tap into a public water supply. Hospitalization is often required and 10% of those who are infected die.

Water Treatment

Besides treating the circulating cooling water in large industrial cooling tower systems to minimize scaling and fouling, the water sometimes filtered to remove particulates, and also be dosed with biocides and algaecides to prevent growth that could interfere with the continuous flow of water. Under certain conditions, a biofilm of micro-organisms such as bacteria, fungi or algae can grow very rapidly in the cooling water, and can reduce the heat transfer efficiency of the cooling tower. Biofilm can be reduced or prevented by using chlorine or other chemicals. A normal industrial practice is to use two biocides, such as oxidizing and non-oxidizing types to complement each other’s strengths and weaknesses, and ensure a broader spectrum of attack. In most cases, a continuous low level oxidizing biocide is used, then alternating to a periodic shock dose of non-oxidizing biocide. All of these chemicals are poisons and entrained in the mist and spread all over the area. The blow down of cooling water which contains concentrated amounts of bacteria and other microbes, as well as chemicals (Poisons) are discharged also to nearby waterways. In many areas, the fish and other marine life are contaminated.
Cooling Tower Operation - In General

There are several Cooling Towers and associated Systems located throughout the Cities and Industrial Areas. Cooling Tower conditions are ideal for mass production of Bacteria, Viruses, Mold, Fungus, Algae and Microbes.

Among the major Bacteria is Legionella which is pathogenic and the leading cause of pneumonia types of illness. As the Cooling Towers accumulate and produce large quantities of this deadly bacteria, each bacteria splits into two bacteria every 5 – 15 minutes.

<table>
<thead>
<tr>
<th>Beginning Number of Bacteria</th>
<th>Number Made in 5-15 Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 bacteria</td>
<td>4 bacteria</td>
</tr>
<tr>
<td>4 bacteria</td>
<td>16 bacteria</td>
</tr>
<tr>
<td>16 bacteria</td>
<td>256 bacteria</td>
</tr>
</tbody>
</table>

**Similarly, Each Billion bacteria splits into Two Billions bacteria Every 5 – 15 minutes. Thus:**

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<tr>
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**Trillions of bacteria and so on . . .**

Although the Chemicals are used in the Cooling Tower for treatment but these bacteria and viruses are produced 60/24/7/365 + 1 (Every 4th Year). Legionella bacteria also attracts other lethal bacteria, viruses and microbes. Algae formation further enhances the growth of microbes at all times.
The Elimination of Cooling Tower & Treatment

Cooling Tower Treatment typically controls:

- **Alkalinity**: Will indicate potential of calcium carbonate scale.
- **Chlorides**: can be corrosive to metals.
- **Hardness**: Contribute to scale in the cooling towers, piping, exchangers.
- **Iron**: when combine with phosphate, iron can foul Equipment.
- **Organic Matter**: promotes microorganism growth which leads to corrosion, fouling and other systems issues.
- **Silica**: Known for causing hard scale deposits.
- **Sulfates**: can be extremely corrosive to metals.
- **Total dissolved solids (TDS)**: Contribute to scaling, fouling and corrosion.
- **Totals suspended solids (TSS)**: Undissolved solids containments that can cause scaling, biofilms and / or corrosion.

Not only Legionella and lethal bacteria are spread by the cooling tower plumes mist but also Algaecides and Biocides as entrained, dissolved chemicals into the surrounding areas. These chemicals attack the breathing function (DNA) of microbes and are categorized as poisons. In addition, the water treatment chemicals also produce dioxin & dioxin compounds and are carcinogens – substances that cause cancer.

UTC Systems not only eliminate the formation of lethal microbes, but also do not spread lethal chemicals or their by-products.
UTC Practical Solution: Alternates For All Types Of Cooling Towers

UTC Closed Loop Cooling Water Systems

The water in the closed water loop removes the heat very similar to the Cooling Tower water. The heat is either rejected or used in the integrated systems. The closed water loop circulates clean water all the time through the heat exchangers to transfer the heat to clean water.

System - 1:
The heat from the clean water is rejected by the air coolers to atmosphere and circulate back to the clean closed water loop.

System –2
• The rejected heat from the clean cooling water system is used to generate hot water for use.
• To supplement energy to generate steam.

System -3
If additional cooling is required, the steam may be used via a Thermal Absorption Chiller (TBC) to generate refrigeration chilled water at 40°F. This chilled water is used to supplement the Mechanical Chiller or if needed to cool the clean closed water loop during the summer months.
UTC Significant Advantages

• Elimination of Cooling Tower and associated systems.
• Elimination of plumes mist leaving the cooling tower and dispersing infectious bacteria, viruses and microbes to the surroundings.
• Elimination of water make up for Cooling Towers.
• Elimination of Cooling Tower Blowdown – Microbes, Solids, Algae & others.
• Elimination of the Cooling Tower Basin Cleaning Up. (According to OSHA, the Cooling Tower Basin must be cleaned twice a year. The workers can be exposed to Microbes and its Bio Hazardous Waste.)
• Elimination of chemicals
• Elimination of fouling in heat exchangers, pipes, etc.
• Enhances energy efficiencies (Reduction in Power/Fuel)

Extraordinary Benefits

• Permanent Elimination of Legionella Bacteria produced by cooling towers.
• Elimination of viruses and microbes with Cooling Tower water operation.
• Elimination of Bio Hazard Waste: Environmental advantages for Local ECO Systems.
• Prevention of unnecessary exposure To Public, Medical Management & Staff and Patients by Legionella bacteria and other deadly microbes.
**Pas-de-Calais, France***

French researchers found that Legionella bacteria travelled up to 6 kilometer (3.7 miles) through the air from a large contaminated cooling tower of a Petrochemical plant in Pas-de- Calais, France. The outbreak killed 21 of the 86 people who had a laboratory-confirmed infection.

* (Ref: Oxford Academic – The Journal of Infectious Diseases)

**Disney Hollywood**

Disney Hollywood was shut down for several weeks as the visitors were exposed to Legionella bacteria produced by Cooling Towers.

**Bronx Hospital, New York**

A Legionella bacteria outbreak killed 12 people and several others were exposed.

* (Ref: Google - Several Legionella Bacteria Outbreaks in the country.)

These diseases are happening in the most advanced and developed countries, Such as the USA and France. Just imagine how many people are infected, suffering and dying in the under-developed and third world countries.

Even a single infection by the Cooling Tower bacteria and virus is too many as the infections spread quickly. There is unnecessary sickness, sufferings and effects the body’s immune system.

*All of us breathe the same air around Cooling Towers and extended areas!*
UTC’s Significant Advantages

• There is excellent payback and reduction in CAPEX and OPEX by modernizing the existing systems.

• Elimination of plumes/mist leaving the cooling tower and dispersing infectious bacteria, viruses and microbes to the surroundings.

• Our alternate systems are clean and have absolutely no impact on local environments (Air & Water)

• Operation at lower costs and Increased profitability

• Absolutely no chemicals are required.

• Significant reduction in disease and healthcare costs.

• Safeguard of marine life and fish.

Cooling Towers produce bacteria, viruses, mold, fungus, algae and microbes.

Among the major Bacteria is Legionella, which is pathogenic and the leading cause of pneumonia type illness. In addition, cooling towers also produce various types of hard scale materials like corrosion & erosion materials. These dirty materials have direct impact on exchangers, pumps, piping and associated systems.

This is the reason that Cooling Towers must be replaced with UTC’s Closed Loop Spiral Systems!

Join us to make America pristine in Health and Environment.

We need the participation of everybody to eliminate this man-made creation of deadly bacteria & microbes and releasing them into the air and water along with chemicals (Poisons) simultaneously.

Medical Institutions, Medical Universities and Centers, Academic Universities, as well as Oil & Gas Refineries, Petrochemicals and all heavy and light and related industries are also welcome. Please do not delay. Every minute someone is being infected in the US. All of these illnesses can be eliminated and prevented and will cure people in the USA and mankind all over the world.
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