



## MEMO – SILENT NOZZLES GUIDANCE INFORMATION

To	All Customers with Data Storage and Fixed Gas Extinguishing Systems	Dated	11-01-17
Concerning	Potential damage to drives from inert gas discharge	From	David Rooney
Response Required	For Information Call if you would like to discuss system modification to avoid risk of losing data	Ref	007

CTA Fire have been made aware of a recent white paper report produced by Siemens (September 2015) entitled “Silent Extinguishing”, and a further media report on an incident, when the BBC News (dated 12th September 2016) released an article in which the ING Bank in Romania suffered unexpected damages to its computer servers during a fire drill, which saw the discharge of a gas-based fire suppression system. This has caused an increase in concerns to some regarding noise level generated from inert gas suppression systems as it was reported that the servers were damaged due to the high noise levels generated by the high pressure release of the system.

Unfortunately these reports are not that specific and low in detail, so we can assume that this “may” apply to all inert agents installed, as this noise derives from the gas pressure rather than a certain product. Therefore as all Inerts are packaged typically mostly in 200 or 300bar cylinders, the following Inerts types involved are known as: IG55, IG541, IG100, and IG01, regardless of manufacturer or brand names.

To explain further, the noise is created only under system discharge circumstances. The high pressure gas exits the system nozzle/s located within the area, at such a speed and velocity, it creates a very loud ambient noise level at the nozzle orifices. These high noise levels have been reported to produce a vibration effect within a computer working hard drive and thus either cause either performance degradation or irreparable damage, and this of course becomes an issue with data and communications losses.

In order to place a balance on this, at present incidences of hard drive damage seem far from being widespread, as for the many service and installations we have performed over many years, and many activations since, we are not aware of any local case to date. Regarding investigating the evidence, CTA Fire cannot find any independent study into the full effects of noise levels at time of any real time inert discharge/s, nor are we aware of any forensic investigation into the hard drive devices themselves, which are reported to have incurred damage. At present we are not aware of relevant facts and without facts, we are yet to understand if this problem is exclusive to, certain extinguishing product, a certain computer product or even certain environments. However, it seems manufacturers are introducing new nozzle designs to “Hush” the noise levels in order to address the risk. For this we will collectively term them as “Hush Nozzles”

Regarding the noise risk, we have recently discussed this with a manufacturer, and their rule of thumb tests under worst case scenario conditions, it has been identified the average standard discharge nozzle produces approximately 126 dB at 2m in a metal enclosure, but due to most real world systems being fitted in much larger rooms, it would be expected that the noise would be significantly less. If in say an open data centre, filled with racks, cabinets, and other hardware, to which exact attenuation cannot be accurately modelled, with the differing designs, sizes of rooms, the potential variety of construction, the passive fire protection materials present, as well as wall coverings, floor carpets, furnishings and ceiling tiles, all which of course can help the absorption of such high noise levels.



### Can this Noise Risk be easily reduced?

With the message being sent out, by reports without any 3<sup>rd</sup> party involvement and the lack of many known cases, is this a real problem or a local problem, and as a risk, can it be rectified easily?

**EN/BS Regulations:** There is no regulation in place for Hush nozzles or maximum permitted noise levels, so Installers cannot predict where /when the nozzle should be applied.

**Hush nozzle approvals:** At present we cannot find a manufacturer with type and calculation approval for these nozzles, so it questions who is responsible for the design and upgrade should the system not extinguish a fire. This may change, but it requires questioning at all times, due to ownership issues.

**Retrofit Hush nozzle cost:** By design, the “Hush” type nozzles currently being marketed are not an item that can be simply changed out on a one for one basis in all cases, as the spread (or throw) of gas agent is disrupted by the new design. This means more nozzles may have to be introduced and this cannot be carried out without replacing the entire pipe network as well as of course the new nozzles. Some system manufactures may not have a “hush” nozzle design, and you cannot mix and match manufactures equipment.

**Use another type of extinguishing system:** In most cases, and inert system can be replaced with a chemical type system such as Novec or HFC227ea (FM200), that typically use only 25 to 40 bars of pressure, and do not suffer the same noise issues. However, on larger areas, these agents can become a cost or storage issue by design.

**Change the hard drives:** As computer hardware in general has a much shorter life than the extinguishing systems surrounding them, the technology moves forward with drives every day, so we would recommend investigating changing the older mechanical drives to the newer solid state larger capacity drives instead. These new drives will not suffer with any noise or extinguishing agent issues, they are easily changed and a cheaper in cost long term. The client can also choose the time of change with no disruption to the services, fabric or working practices of the area/s of concern.

**Turning off the drives before a system discharge:** The BS/EN regulations on any extinguishing system have always pointed towards any protected working electrical system, its power source and any room air conditioning or fan unit requiring to be turned off before an Extinguishing system discharge is imminent (Normal at 1<sup>st</sup> stage alarm). This is a recommendation in place to limit the fire and to make sure the fire did not reoccur after it was extinguished. So we can assume it will also help to limit noise damage (if any) on a working system that at the time of discharge is turned off.

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