

March 2, 2017

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards  
Division of Material Safety, State, Tribal, and Rulemaking Programs  
Materials Safety Licensing Branch  
Mail Stop: T8E18  
Attn: Tomas Herrera  
Two White Flint North  
11545 Rockville Pike  
Rockville, MD 20852-2738

Re: Request for Additional Information  
Docket No. 030-36971  
License No. 09-23920-01E

Dear Mr. Struckmeyer

The following is a response to your request for additional information. Each response is enumerated per your questions.

**A. Information required for review of Sealed Source and Device amendment application.**

1. Model NM1092C is the proper and complete designation for the model timepiece.
2. Model NM1092C will have a maximum activity of 102.3 mCi (3.79 GBq).
3. See Attachment "A". The location will be on the lower face of the timepiece.

**B. Information required for review of exempt-distribution license amendment application**

1. Attachment "B" is a cross section of the timepiece. The crystal is constructed of sapphire glass. The sapphire glass is permanently sealed to the bevel encasing the GTLSs. The only accessible part of the timepiece is through the underside which will allow access to the mechanical movements of the timepiece. Access to the underside requires specialized tools and is not a function of normal operation or use of the timepiece.
2. The useful life of the GTLS is approximately one half-life of H-3 (approximately 12.3 years). At this time, the H-3 still interacts with the phosphor contained in the borosilicate glass tube but with less intensity. However, the mechanical portion of the timepiece still functions without regard to the H-3 concentration and are not discarded.
3. Pursuant to 10 CFR 32.23, the standard required by the NRC is the likeliness of external radiation dose from normal use and disposal. There is no likelihood of all GTLS tubes simultaneously rupturing. No GTLS leakage has been reported from a timepiece. The dose estimates were used based on an unlikely scenario that one GTLS would leak as a result of manufacturing. The likelihood of all the GTLS tubes simultaneously becoming damaged is an impossibility and falls outside the requirements of 10 CFR 32.

For all GTLS tubes to simultaneously rupture would require a destruction of the timepiece crystal. The timepiece crystals are sapphire. Sapphires (also known as Corundum) have a hardness of 9 on the Mohs scale. Sapphires are mechanically second only to a diamond which has the maximum hardness of 10 on the Mohs scale. Sapphire glass is one of the hardest and most scratch resistant materials available. The high modulus of elasticity and high tensile strength make it extremely wear, abrasion and impact resistant.

Sapphire glass is thermally very stable. It does not lose any of its mechanical and optical qualities from temperatures ranging from cryogenic to over 2000C. There is no surface damage and devitrification due to extreme thermal cycling. Sapphire glass is more resistant to corrosive chemicals than most standard hard materials available.

Even in the event all GTLS tubes becoming damaged, the H-3 would still be sealed between the sapphire crystal and hardened steel which has a hardness of 7-8 on the Mohs scale.

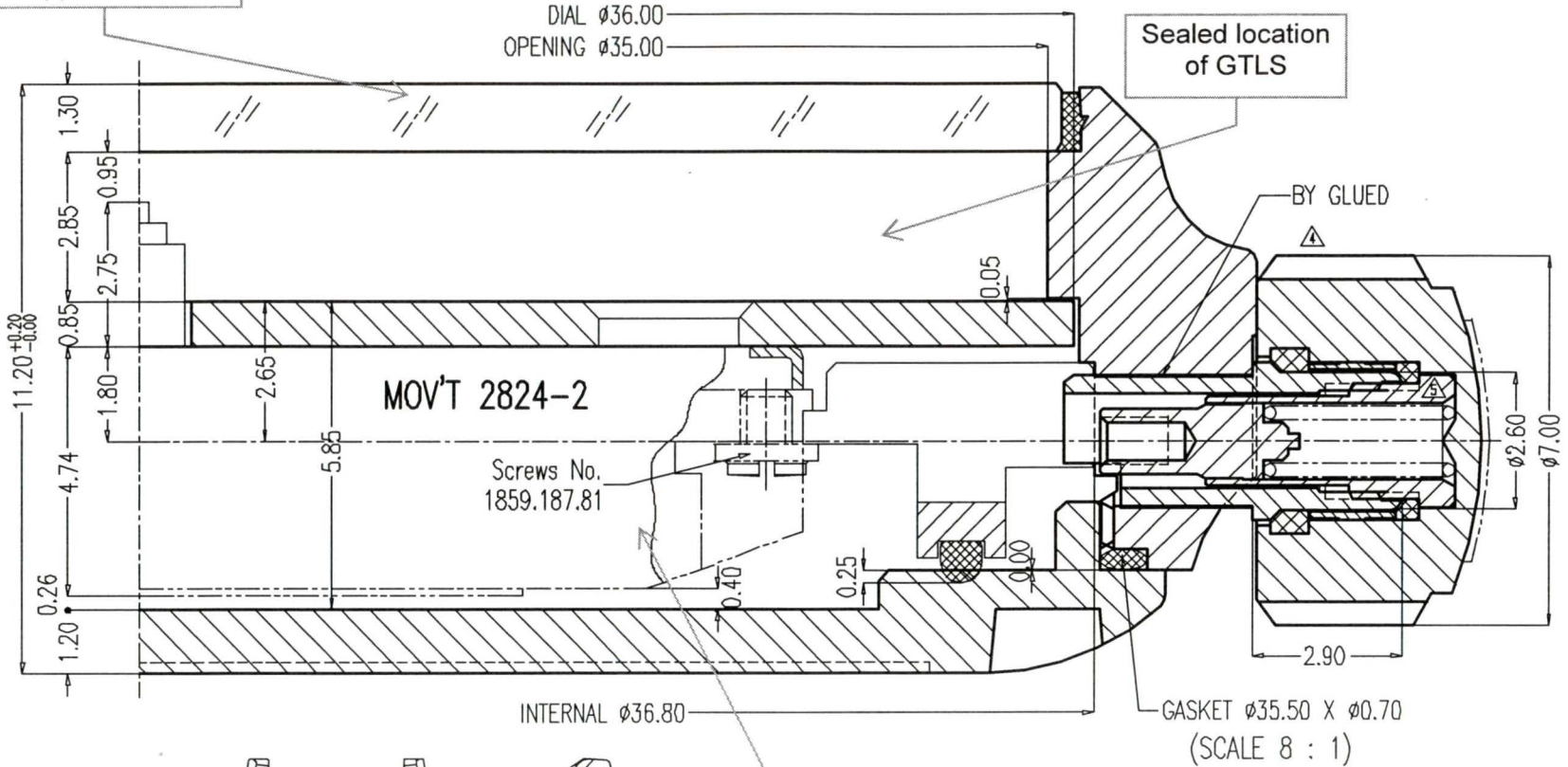
Sincerely



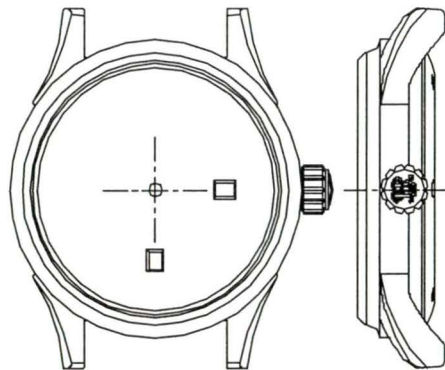
Jeffrey Hess  
Hess Fine Art



Sapphire Glass



Mechanical Movements



△	2009-04-11
△	2008-10-27
△	2008-07-23
△	2008-06-27
△	2008-04-29
△	2008-04-28
△	2007-06-01
△	2007-05-21
△	2007-05-08

**LF LUEN FUNG WATCH CASE FACTORY LIMITED**

CUSTOMER: BALL	MODEL: 3775GS-C	DRAWER: Deng
YOUR MODEL: NM1092C		DATE: 2007-03-31
MOVEMENT: 2824-2	A T M: 10	13 PAGES
		CHECKER: