

## The Best Time to Replace an Aluminum Panel on your PAST Trainer

by Gary Schott and Jim Flanagan

Airport Professional Services (APS) is approaching 100 deliveries of their Penetration Aircraft Skin Trainer (PAST Trainer). There are two questions APS is asked periodically by trainer owners: 1) When is the best time to replace a penetration panel? and 2) How long is the Trainer designed to last? APS provides the following answers to those questions:

The answer to the first question is not quite as simple as it might appear.

- When panels are initially mounted on a PAST Trainer they are in pristine condition for optimum High Reach Extendable Turret (HRET) penetration training. The panels are designed to provide an ideal and realistic penetration training experience because they are constructed of aircraft grade aluminum, the Trainer is 16 feet high, the penetration grid is located at the top and curved to emulate the curvature of a large aircraft fuselage. The panels fit tightly on the curved grid to provide an ideal penetrating surface and are secured with large wing nuts that make the panels easy for firefighters to remove and replace, even when wearing gloves. The most logical time to replace a panel is simply when there is no more penetration space left on it. Methods of conserving panel penetration surface for the purpose of extending panel space and usability are provided in the PAST Trainer HRET Penetration Training Guide, supplied with the Trainer. However, there are circumstances that could occur over time that reduces its training value. We examine the most common occurrences below, and we refer to the HRET Skin Penetration Nozzle (SPN) as the "HRET tip" herein.



- Penetrating between the holes can extend panel usability; however, doing so enough times can create very large holes that can lessen the uniform tightness of that panel thus reducing the quality of the penetrations. Also,

doing so can cause bits of aluminum to fall to the ground. The fallen pieces should be picked up to prevent them from possibly becoming foreign object damage (FOD) candidates. Those pieces are sharp, so they should be handled using gloves.

- Depending on the design of the HRET, tip penetrations and extractions made at imprecise angles can possibly cause friction and drag, and might even cause panel buckling upon extraction that can reduce the panel's tightness and its training effectiveness.



- One good rule of thumb for replacing a panel is when it is full of holes, the resistance of the panel has been reduced. Or, if the HRET tip skips across the panel instead of penetrating it, the panel has lost its training effectiveness and should be replaced. Penetrations should remain as realistic as possible, that is, most similar to penetrating an actual aircraft fuselage.

- APS applies high visibility tape to the panels to show where firefighters must avoid penetrating to prevent damage to the underlying grid. As a panel gets used up firefighters are tempted to encroach ever closer to the high-visibility tape. Be extra careful not to accidentally hit the underlying curved penetration grid with the HRET tip, which could possibly damage both the grid and the tip. If the tape has faded over time or has begun to pull away from the panel surface, replace it as soon as possible.

- Each panel should be used to its fullest. Your HRET operators are in the best position to notice and report reduced quality penetrations. Whenever there is any doubt, don't hesitate to replace a panel. Keep using each panel as long as Training Officers feel they are providing quality HRET penetration training.

- How well your firefighters become trained and certified is the measure of the effectiveness of your training materials, including the PAST Trainer. Only when HRET

---

operators are able to apply their penetration training expertly will they have the ability and self-confidence to properly penetrate an aircraft fuselage and fight an interior fire safely, rapidly, and successfully.

- The use of a salvaged aircraft erected at the proper height for hands-on training is perhaps the ideal HRET penetration training situation because it is the “real thing”, not a mock up. However, a salvaged aircraft can become unsightly and are expensive to replace compared to the relatively inexpensive and attractive PAST Trainer. Most importantly, an aircraft will eventually run out of penetration surface—whereas PAST Trainer panels can be replaced indefinitely.

The answer to the second question is quite simple—if you do not damage your Trainer it will last indefinitely. It is designed to last forever; it is constructed of heavy-duty steel; it is completely welded with high quality welds; it is totally powder coated and has weep holes and water drain channels designed to prevent rust and corrosion—so it requires virtually no maintenance.

ARFF Chiefs and ARFF Training Officers know they owe it to their firefighters to provide the best possible HRET

penetration training program to perfect the ability of their firefighting crew to ensure the safety of flight crews and passengers whose lives they are committed to protect in an aircraft emergency.

**About the Authors:**

**Gary Schott, President of Airport Professional Services (APS), designed and developed the PAST Trainer. He spent many years as a firefighter in the USAF, followed by being the Fire Chief at several Air Force Bases and the Omaha Airport Authority. Also, he served as Chairman of the ARFF Working Group. Gary manages the manufacturing, production, and shipment preparation of the PAST Trainer and aluminum panels.**

**Jim Flanagan is President of Flanagan Consulting and APS Director of Operations. Jim has been a long time member of the ARFFWG. APS contracts with Flanagan Consulting to manage all day-to-day operations, including contents maintenance of the APS web-site—[www.apspast.com](http://www.apspast.com). ■**