



AQUA LUNG®

Personal Helicopter Oxygen Delivery System

Aqua Lung America

Dan Riffie

2007

Briefing Objectives

- Team members
- Background of system
- PHODS system
- Applications
- PHODS Console
- Conclusion

Team Members

- Aqua Lung America
 - High pressure breathing devices and regulators
- Gentex, West
 - Helmets
- Mountain High
 - Oxygen supply systems for civil gliders (high altitude)
- Breathing Air Systems
 - Oxygen and compressed gas

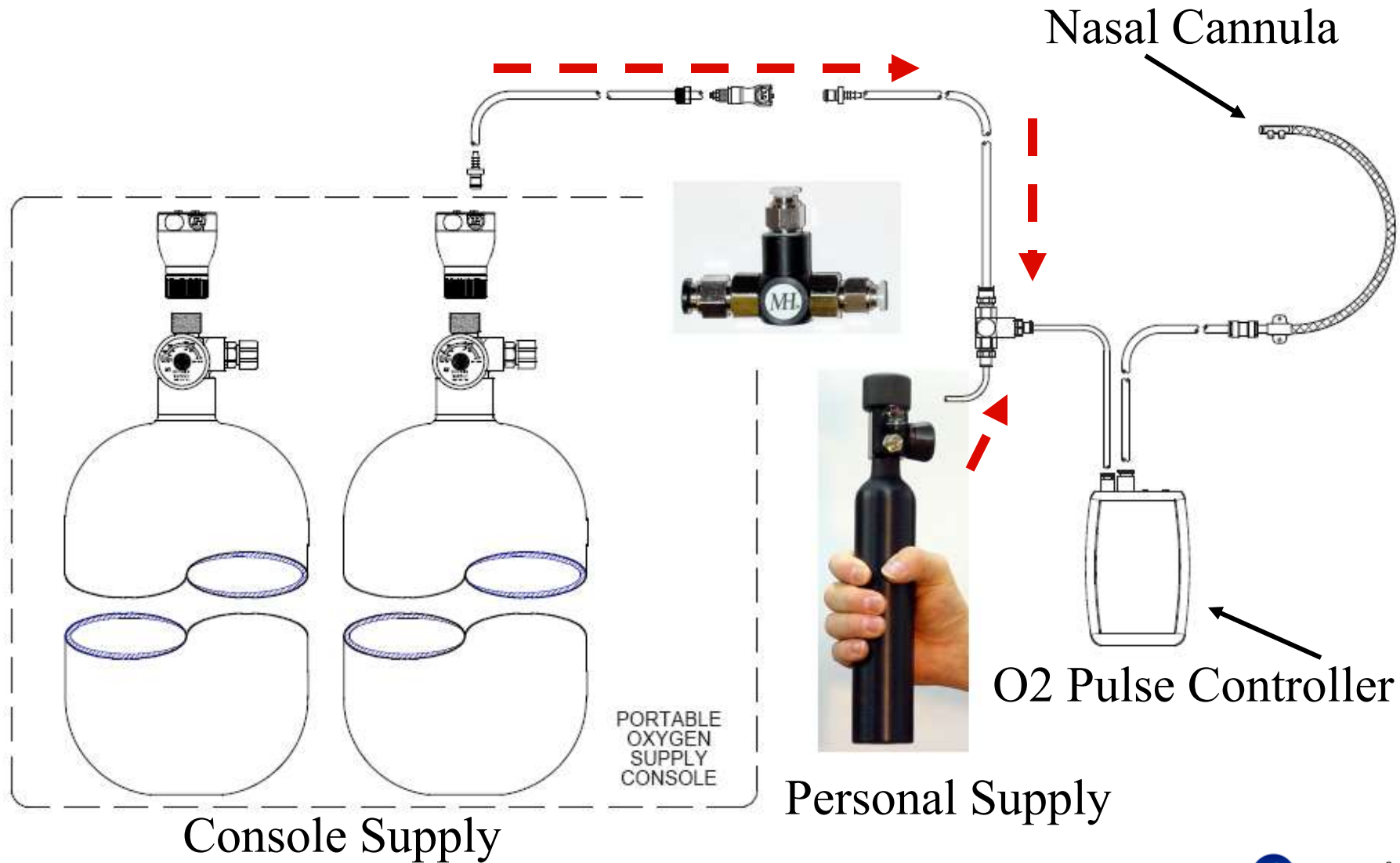
Background

- Operations in Afghanistan exposed and demonstrated Army Aviation needs
- Current system is over 25 years old
- No system specifically designed for helicopter flight below 18,000 ft
- Need for robust and individual system
- Required to integrate into today's combat gear
- Soldiers need for automatic delivery of oxygen
- Need for compact and efficient oxygen system

Helicopter Oxygen Delivery System

- Definition:
- A light weight personal oxygen delivery system that once turned on will deliver oxygen to the user and change delivery volumes based on the altitude.
- Integrated system that utilizes the MOLLE attachment system for variable mounting and configuration requirements.
- Can be used as a primary delivery of oxygen, an emergency system and for escape & evasion at high altitudes. Secondary, but not designed for, can also be used for medical applications.

System Overview



PHODS Overview

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Helmet System Connections



System Description

- Existing Emergency Breathing Device, SEA or Survival Egress Air (Aqua Lung)
- Existing Pulse Regulator, OPC or Oxygen Pulse Controller (Mountain High)
- Developed nasal cannula (Gentex)
- Existing oral nasal mask (Gentex)
- Oxygen Generator, (Breathing Air Systems)

SEA “Before and After”



Before



After

Oxygen Pulse Controller

- Commercial item from civil glider community
 - 8 ounce battery operated (AA)
 - Input pressure 15 psi
 - No flow alarm
 - Senses barometric pressure
 - Senses user inspiration
 - Delivers measured O₂ automatically
 - Adapts to each individual that includes anticipating breathing cycles

Oxygen Pulse Controller “OPC”

Red=Inlet

Blue=Outlet



OPC Modes of Operation

- Off
- On = Automatically begins delivery of oxygen after crossing 10,000 ft
- F 20 = Oral nasal mask setting for increased flow
- R/M = Reserve Manual mode for 15 liters of constant flow
- Automatically stops delivery at 8,000ft msl in descent

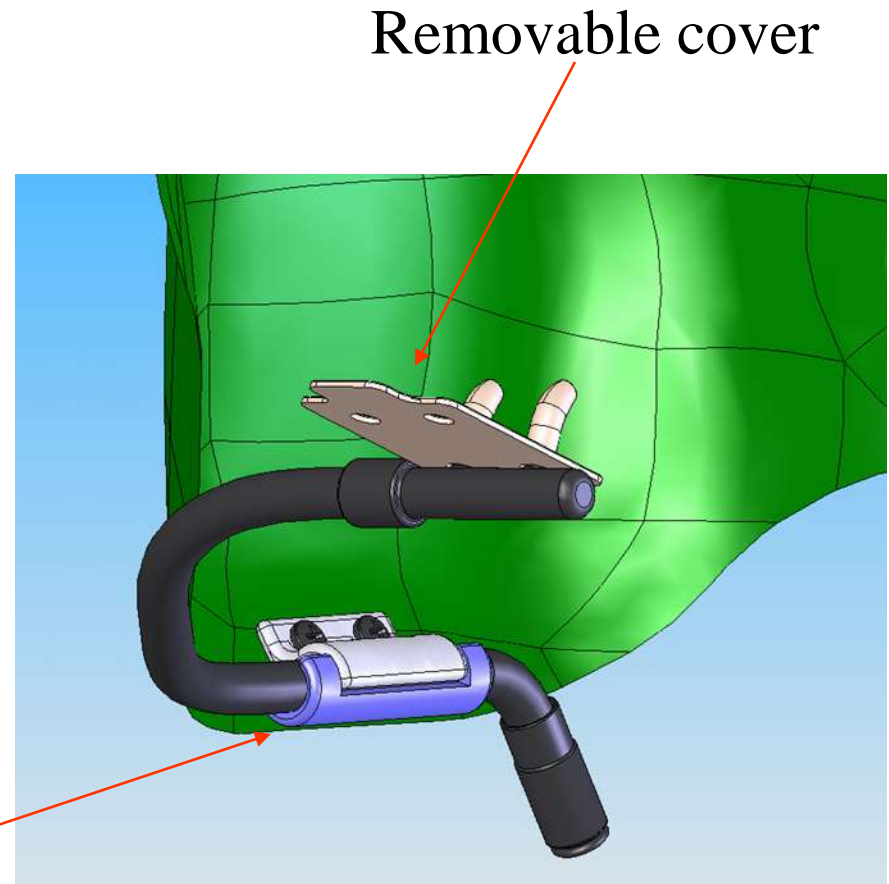
HODS Cannula

- Robust flexible boom
- Delivers oxygen to user via nasal passage
- Mounts on all helmets
- Attachable and removable in flight
- Removable soft rubber cover for cleaning or replacement
- Placed on right or left side of helmet
- Must breath through your nose

HODS Cannula



Flexible boom



Robust clip in mount

AH-64 Apache Helmet Integration



HODS Mask

- Lightweight soft rubber mask
- Attachment by Maxiofacial shield clips
- Fits inside maxiofacial shield
- Standard military microphone

HODS Oral / Nasal Mask



PHODS Console

- 50 Cubic ft. cylinders
- Ballistic protected container
- 12 person output



HODS Conclusion

- HODS is an efficient oxygen delivery system that reduces oxygen consumption while maintaining blood oxygen saturation
- Designed specifically for helicopters
- Multiple applications
- Flexible integration for all helo applications
- Established subcomponents and proven team members
- Easy maintenance
- Turn key support – maintenance, training and O2 supply

HODS Current Status

- Steel cylinder under testing
- Currently in environmental testing
- Design is frozen
- Delivery begins 90 days after receipt of order
- Projected production this year is 1,500-2,000 systems
- Improved O2 console in progress

Aqua Lung America POC

Dan Riffie

Driffie@shentel.net

540-459-4495 EST

Dave Stancil

Dstancil@aqualung.com

760-597-5065

TRANSAERO, inc.

The top banner features the Aqua Lung logo in the center, which consists of the word "AQUA" in black, a blue circular icon with a white stylized wave, and the word "LUNG" in black with a registered trademark symbol. The background of the banner includes a soldier in military gear on the left, a scuba diver on the right, and a topographic map with contour lines and elevation numbers (800, 3000, 2400) in the center.

AQUA LUNG®

Helicopter Oxygen Delivery System

Questions

A large, light blue watermark of the Aqua Lung logo is positioned on the right side of the slide, partially overlapping the "Questions" text.