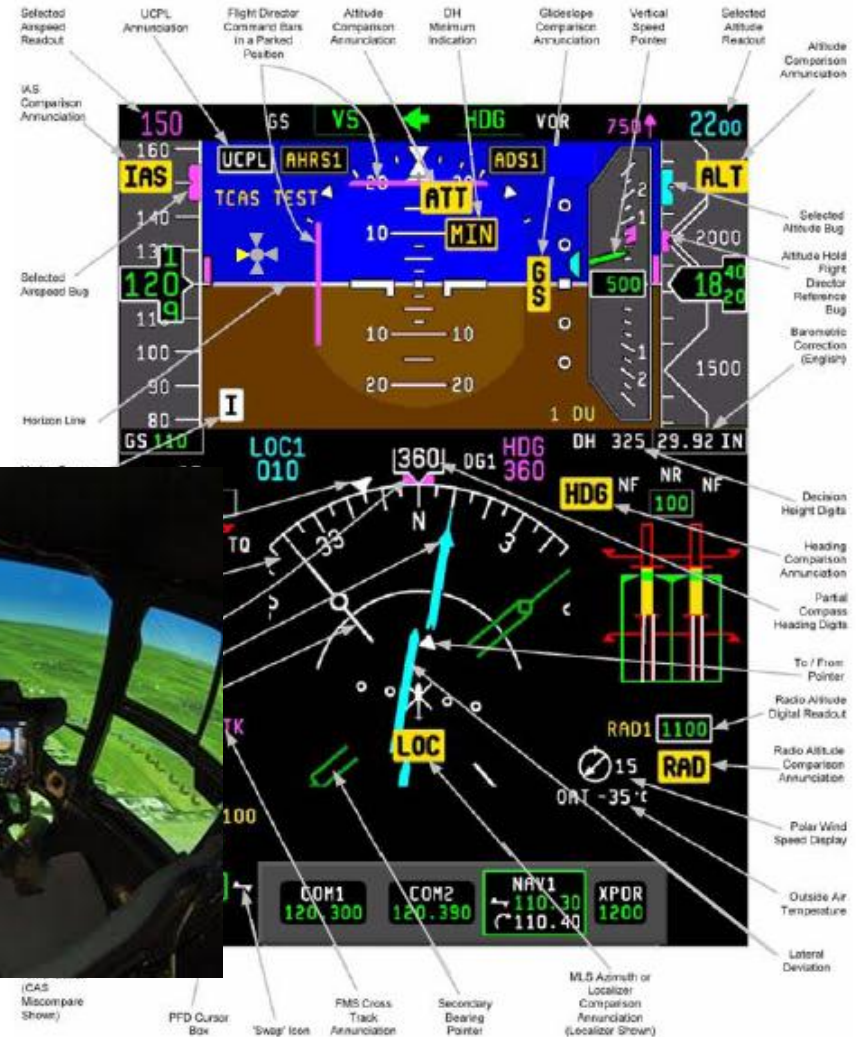


Uuden tekniikan tuomat mahdollisuudet ja uhat lentokoulutuksessa



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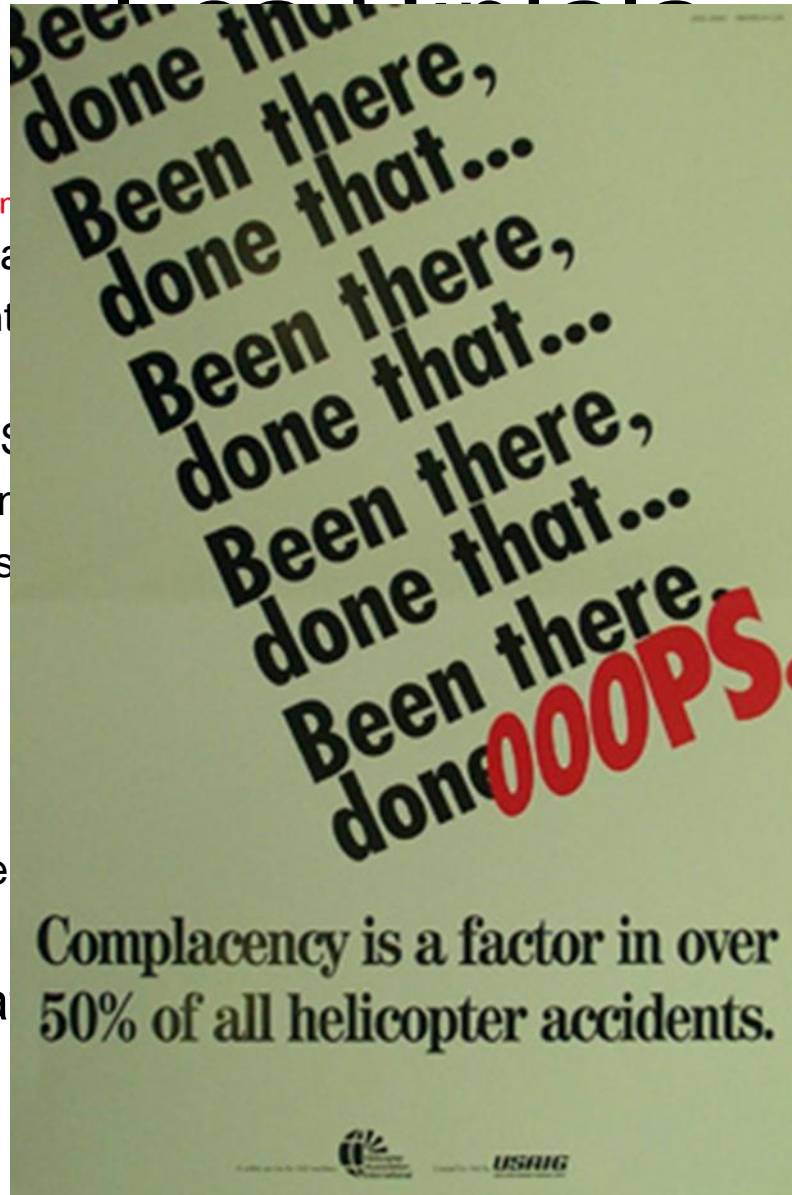
Photos; AW, EC, Robinson, Bond, Mikko Maliniemi, HAI, Esa Rintala photo library



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- Oppimassa maailmanlaajuisesti
– Flight Safety International
– Bundespolizei
– Lufttransport AS
– Agusta-Westland
– Bell Helicopters
– Eurocopter
– FinnComm
– Finnair
– SAS
– Bond Helicopters

- Ja oppiminen ja



skoulutus 1987-1991,

/1991-2008

ällikkö 2006-

isuusupseeri 1997-

pettaja/ tarkastuslentäjä

kinta 1998 IlmaV

ehistöjen MCC-, IFR- ja

optereita...

412, EC135,

19, Bell407, Bell206,

entokokemus

kokemus

opettajana

Who needs this technology...



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(Instructor/student) Human factors

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- **Advantages of Automation**

1. Reduces manual workload and fatigue
2. Relief from small errors
3. Economical utilization of machines
4. Precision in the handling of routine tasks
5. Increased productivity

- **Disadvantages of Automation**

- Automation- induced failures
- False alarms
- Boredom
- Increase in mental workload due to additional monitoring of systems
- Over-reliance, complacency; willing to accept results without scrutinizing them first
- Silent failures
- Reduced alertness of operator, by offering a false sense of security



Do You (want to) know the Design?

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- To command effectively, **the human operator must be involved**
- In order to be involved, **the human operator must be informed**
- **The pilot must be able to monitor** the automated system
- **The automated systems must also be able to monitor the human operator and the human must be able to monitor the automatics**
- Each element of the system **must have knowledge of the others intent**

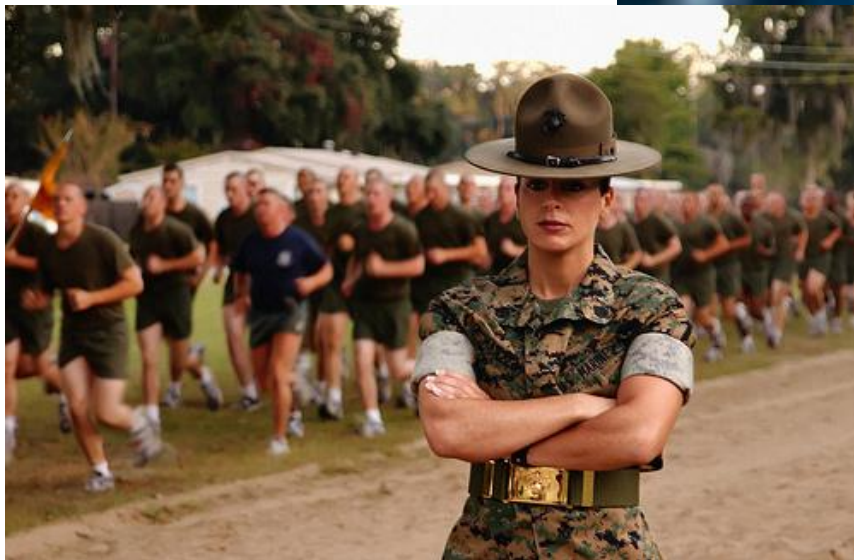
System error dilemma

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- **Dealing with the problem of no system being error free**
- **Dealing with error due to operator entry into the system**

Instructor techniques...

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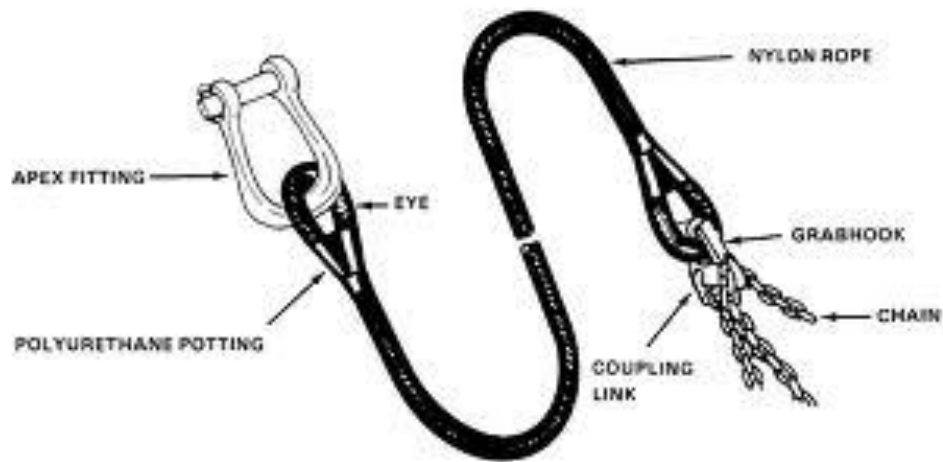


70's = Proper configuration



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- Rotor RPM
- Both Engines
- Autopilot



80's Environmental monitoring



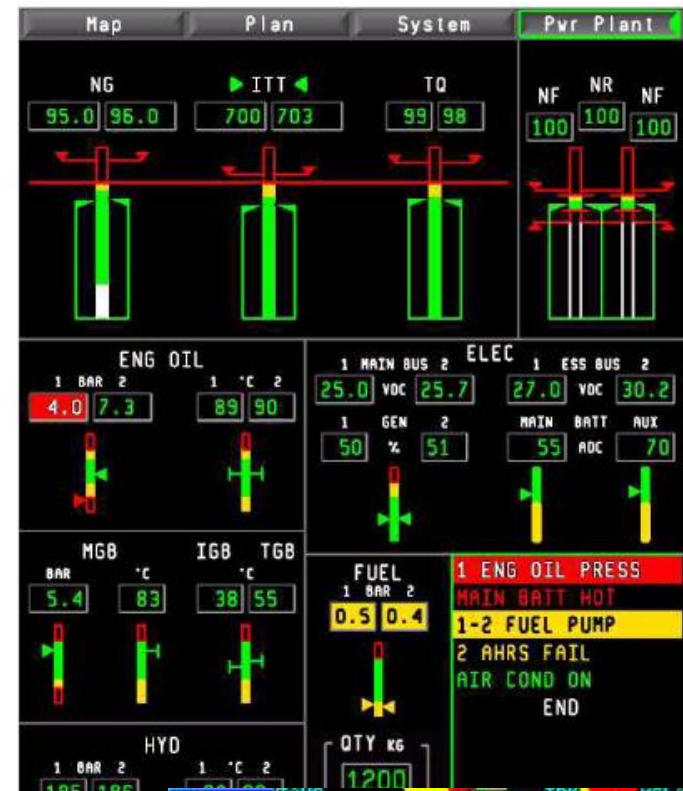
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NOW SA

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- Monitoring systems
- Audio
- Symbols
- Changing priority
- Environment
 - NVIS
 - IFR
 - Mission
- Complexity



Automation philosophies

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- Boeing
 - Pilot final authority
 - Assist, not replace pilots
 - New technology only when no effects to human interface
- Airbus
 - Must not work against operators input, if not required due safety
 - Must not reduce aircraft reliability
- Your helicopter?





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-some new powder

BUT

-basics are basics...

Future



KITOS!