



1
00:00:02,580 --> 00:00:04,980

[NARRATOR]

HI, I'M BILL BARRY, NASA'S CHIEF HISTORIAN.

2
00:00:04,980 --> 00:00:09,260

WE'RE HERE IN THE NASA HEADQUARTERS HISTORICAL
REFERENCE COLLECTION – A PLACE WHERE WE

3
00:00:09,260 --> 00:00:13,990

MAINTAIN AN ARCHIVE OF DOCUMENTS, RECORDS,
AND REFERENCE BOOKS THAT RESEARCHERS CAN USE

4
00:00:13,990 --> 00:00:16,670

AND THAT WE USE TO ANSWER ALL SORTS OF QUESTIONS.

5
00:00:16,670 --> 00:00:20,510

IN ADDITION TO NASA RECORDS, WE ALSO HAVE
RECORDS FROM THE NATIONAL ADVISORY COMMITTEE

6
00:00:20,510 --> 00:00:22,000

FOR AERONAUTICS – THE NACA.

7
00:00:22,000 --> 00:00:25,800

WE'VE BEEN PRETTY BUSY HERE FOR THE LAST
YEAR GETTING READY TO MARK THE CENTENNIAL

8
00:00:25,800 --> 00:00:28,170

OF THE
CREATION OF THE NACA.

9
00:00:28,170 --> 00:00:33,530

BUT THE IMPORTANCE OF THE NACA IS NOT JUST
A MATTER OF OLD BOOKS AND DUSTY RECORDS – THE

10
00:00:33,530 --> 00:00:37,589

STORY OF THE N-A-C-A IS
ONE OF INCREDIBLY DEDICATED PEOPLE PUSHING

11
00:00:37,589 --> 00:00:41,970

THE CUTTING EDGE OF NEW TECHNOLOGIES AND DOING THAT IN NEW AND CREATIVE WAYS.

12

00:00:41,970 --> 00:00:46,600

IT HAD SUCH A REVOLUTIONARY IMPACT ON OUR WORLD THAT WE HARDLY NOTICE IT THESE DAYS.

13

00:00:46,600 --> 00:00:50,040

BUT, YOU MIGHT NOT HAVE GUESSED THIS FROM ITS MODEST BEGINNINGS.

14

00:00:50,040 --> 00:00:55,610

WITH THE PASSAGE OF THE NAVAL APPROPRIATIONS ACT ON MARCH 3, 1915, THE NACA CAME INTO EXISTENCE.

15

00:00:55,610 --> 00:01:00,940

IT'S MISSION: TO SUPERVISE AND DIRECT THE SCIENTIFIC STUDY OF THE PROBLEMS OF FLIGHT

16

00:01:00,940 --> 00:01:04,330

WITH A VIEW TO THEIR PRACTICAL SOLUTION, AND TO DETERMINE THE PROBLEMS WHICH SHOULD BE

17

00:01:04,330 --> 00:01:09,250

EXPERIMENTALLY ATTACKED, AND TO DISCUSS THEIR SOLUTION AND THEIR APPLICATION TO PRACTICAL

18

00:01:09,250 --> 00:01:11,800

QUESTIONS.

19

00:01:11,800 --> 00:01:16,040

ORIGINALLY THE COMMITTEE WAS JUST THAT – A 12 MEMBER GROUP APPOINTED FROM THE MILITARY

20

00:01:16,040 --> 00:01:19,240

AND OTHER PARTS OF THE GOVERNMENT, AS WELL AS ACADEMIA AND INDUSTRY EXPERTS.

21

00:01:19,240 --> 00:01:24,290

ALTHOUGH IT WOULD BE 2 YEARS BEFORE THE UNITED

STATES JOINED THE CONFLICT, IN 1915 WAR WAS

22

00:01:24,290 --> 00:01:26,560

ALREADY RAGING ACROSS EUROPE AND GROWING ON
THE OCEANS.

23

00:01:26,560 --> 00:01:28,990

WAR HAD ALSO MOVED INTO THE AIR...

24

00:01:28,990 --> 00:01:33,600

IT WAS JUST ABOUT A DOZEN YEARS SINCE THE
WRIGHT BROTHERS FIRST SUCCESSFUL FLIGHTS AT

25

00:01:33,600 --> 00:01:34,600

KITTY HAWK.

26

00:01:34,600 --> 00:01:39,280

BUT, MUCH TO OUR SURPRISE, THE UNITED STATES
FOUND ITSELF TO BE FAR BEHIND EUROPE IN AERONAUTICS.

27

00:01:39,280 --> 00:01:41,840

HOW DID THAT HAPPEN?

28

00:01:41,840 --> 00:01:46,780

WELL, AFTER THE WRIGHTS DEMONSTRATED THEIR
FLYER IN FRANCE IN 1908 EUROPEAN GOVERNMENTS

29

00:01:46,780 --> 00:01:51,390

AND INDIVIDUALS BEGAN TO INVEST MILLIONS IN
AERONAUTICS RESEARCH.

30

00:01:51,390 --> 00:01:57,320

BY 1912 THE FRENCH GOVERNMENT WAS SPENDING
\$6.4 MILLION DOLLARS ANNUALLY ON AIRCRAFT

31

00:01:57,320 --> 00:01:58,840

RESEARCH AND CONSTRUCTION.

32

00:01:58,840 --> 00:02:00,890

THE RUSSIAN EMPIRE WASN'T FAR BEHIND THAT YEAR AT \$5 MILLION.

33

00:02:00,890 --> 00:02:08,729

IN THE UNITED STATES GOVERNMENT SPENDING ON AVIATION IN 1912 WAS ONLY \$140,000.

34

00:02:08,729 --> 00:02:16,160

BY 1911 EVERY MAJOR COUNTRY IN EUROPE HAD A GOVERNMENT FUNDED AERONAUTICS LABORATORY.

35

00:02:16,160 --> 00:02:21,920

AS A RESULT, BY THE START OF WORLD WAR I, EUROPE WAS FAR AHEAD IN AIRCRAFT TECHNOLOGY

36

00:02:21,920 --> 00:02:25,090

AND EVEN SHEER NUMBERS OF MILITARY PLANES.

37

00:02:25,090 --> 00:02:32,000

WHEN THE WAR STARTED THE FRENCH FIELDED 1,400 MILITARY AIRPLANES, GERMANY 1,000, IMPERIAL

38

00:02:32,000 --> 00:02:36,760

RUSSIA 800, AND GREAT BRITAIN 400.

39

00:02:36,760 --> 00:02:40,290

THE US HAD JUST 23 MILITARY AIRCRAFT.

40

00:02:40,290 --> 00:02:46,630

THE UNITED STATES WAS CERTAINLY NOT AGAINST TECHNOLOGY – AFTER ALL BY DECEMBER OF 1915

41

00:02:46,630 --> 00:02:50,250

HENRY FORD HAD ROLLED HIS 1 MILLIONTH CAR OFF THE ASSEMBLY LINE.

42

00:02:50,250 --> 00:02:55,600

SILENT FILMS WERE ALL THE RAGE – BUT BETWEEN THE WRIGHT BROTHER'S PATENTS AND A LACK

43

00:02:55,600 --> 00:02:59,560

OF GOVERNMENT INTEREST, WE LAGGED FAR BEHIND
EUROPE IN AERONAUTICS – AND WOUND UP HAVING

44

00:02:59,560 --> 00:03:01,640

TO USE EUROPEAN AIRCRAFT WHEN WE ENTERED THE
WAR.

45

00:03:01,640 --> 00:03:07,490

AT THE FIRST MEETING OF THE COMMITTEE ON APRIL
23, 1915, THEY SELECTED AN EXECUTIVE COMMITTEE

46

00:03:07,490 --> 00:03:09,360

TO MANAGE DAY-TO-DAY ISSUES.

47

00:03:09,360 --> 00:03:15,390

CHARLES WALCOTT, SECRETARY OF THE SMITHSONIAN,
WAS CHOSEN AS CHAIRMAN OF THE EXECUTIVE COMMITTEE.

48

00:03:15,390 --> 00:03:19,920

EVEN THOUGH THE COMMITTEE MEMBERS WERE NOT
PAID, THE MEAGER \$5,000 BUDGET DID NOT GO

49

00:03:19,920 --> 00:03:21,550

VERY FAR.

50

00:03:21,550 --> 00:03:26,340

FOR THE MOST PART IT WENT TO PAY RESEARCHERS
IN ACADEMIA AND OTHER GOVERNMENT AGENCIES.

51

00:03:26,340 --> 00:03:30,810

THE COMMITTEE WOULD ISSUE A RESEARCH AUTHORIZATION
ON A TOPIC IT THOUGHT WAS OF INTEREST AND

52

00:03:30,810 --> 00:03:33,319

OTHERS WOULD DO THE WORK.

53

00:03:33,319 --> 00:03:38,340

EXECUTIVE COMMITTEE CHAIRMAN WALCOTT, AND

A GROUP OF OTHERS, HAD MUCH GREATER HOPES.

54

00:03:38,340 --> 00:03:42,380

WALCOTT MADE IT HIS BUSINESS TO PUSH FOR THE CONSTRUCTION OF NACA RESEARCH FACILITIES.

55

00:03:42,380 --> 00:03:46,520

IT WAS AN UPHILL STRUGGLE – WITH PRESIDENT WILSON HIMSELF OPPOSED TO IT, BUT CONGRESS

56

00:03:46,520 --> 00:03:52,959

VOTED IN FAVOR OF ADDING \$85,000 TO THE NACA BUDGET FOR A LABORATORY IN 1916 AND WORK ON

57

00:03:52,959 --> 00:03:56,200

IT FINALLY BEGAN IN 1917.

58

00:03:56,200 --> 00:04:00,569

IT WAS NAMED IN HONOR OF WALCOTT'S PREDECESSOR AS SECRETARY OF THE SMITHSONIAN, THE LANGLEY

59

00:04:00,569 --> 00:04:06,660

MEMORIAL AERONAUTICAL LABORATORY AND IT ROSE SLOWLY NEAR HAMPTON, VIRGINIA.

60

00:04:06,660 --> 00:04:12,130

EVENTUALLY THE NACA WOULD GROW TO A TOTAL OF 3 MAJOR LABORATORIES AND 2 MAJOR TEST FACILITIES.

61

00:04:12,130 --> 00:04:17,680

JUST BEFORE WORLD WAR II AMES RESEARCH CENTER WAS BUILT IN CALIFORNIA'S BAY AREA.

62

00:04:17,680 --> 00:04:22,509

THIS WAS QUICKLY FOLLOWED BY THE AIRCRAFT ENGINE RESEARCH LABORATORY IN CLEVELAND OHIO.

63

00:04:22,509 --> 00:04:26,439

AFTER THE WAR, IT WAS RENAMED IN HONOR OF THE LATE NACA DIRECTOR OF RESEARCH GEORGE

64

00:04:26,439 --> 00:04:28,479

LEWIS – THE LEWIS LABORATORY.

65

00:04:28,479 --> 00:04:34,139

IT HAS SINCE BEEN RENAMED IN HONOR OF OHIO
NATIVE JOHN GLENN.

66

00:04:34,139 --> 00:04:38,210

AFTER THE WAR THE NACA ALSO ESTABLISHED A
TEST FACILITY AT WALLOPS ISLAND, VIRGINIA,

67

00:04:38,210 --> 00:04:40,500

AND A HIGH SPEED FLIGHT TEST FACILITY IN THE
HIGH

68

00:04:40,500 --> 00:04:45,479

DESERT OF CALIFORNIA – NOW KNOWN AS THE
ARMSTRONG FLIGHT RESEARCH CENTER.

69

00:04:45,479 --> 00:04:48,939

THESE FACILITIES, AND THE AMAZING PEOPLE WHO
WORKED AT THEM, WERE RESPONSIBLE FOR MANY

70

00:04:48,939 --> 00:04:51,699

BREAKTHROUGHS IN AERONAUTICS AND SPACE.

71

00:04:51,699 --> 00:04:55,240

BUT FOR THE 200 HUNDRED OR SO PEOPLE THAT
WORKED AT LANGLEY, THE FIRST BIG BREAKTHROUGH

72

00:04:55,240 --> 00:04:58,110

CAME IN THE LATE 1920S.

73

00:04:58,110 --> 00:05:02,759

USING WHAT WAS THEN THE WORLD'S LARGEST
WIND TUNNEL, AND ONE DESIGNED TO STUDY PROPELLERS,

74

00:05:02,759 --> 00:05:08,580

NACA RESEARCHERS LED BY FRED WEICK DISCOVERED THAT WRAPPING AIRPLANE ENGINES IN A PROPERLY

75

00:05:08,580 --> 00:05:13,020

SHAPED METAL COWLING NOT ONLY GREATLY REDUCED THE DRAG ON THE AIRPLANE, BUT IT ACTUALLY

76

00:05:13,020 --> 00:05:14,689

IMPROVED ENGINE COOLING.

77

00:05:14,689 --> 00:05:19,629

UP TO THAT POINT AIRPLANE ENGINES HAD USUALLY BEEN FULLY EXPOSED, IN THE BELIEF THAT THIS

78

00:05:19,629 --> 00:05:22,330

WAS THE ONLY WAY TO KEEP THEM FROM OVERHEATING.

79

00:05:22,330 --> 00:05:27,229

THIS FINDING HAD HUGE EFFECTS – INCREASING THE SPEED AND RANGE OF AIRCRAFT, AT AN EXTREMELY

80

00:05:27,229 --> 00:05:29,490

SMALL COST TO MANUFACTURERS.

81

00:05:29,490 --> 00:05:35,710

IN 1929 THE NACA WAS AWARDED THE FIRST OF 5 COLLIER TROPHIES – AN AWARD PRESENTED

82

00:05:35,710 --> 00:05:39,250

FOR THE GREATEST ACHIEVEMENT IN AERONAUTICS EACH YEAR.

83

00:05:39,250 --> 00:05:44,009

IT ALSO LED TO A SIGNIFICANT BUDGET INCREASE FOR THE NACA WHICH ALLOWED IT TO BUILD MANY

84

00:05:44,009 --> 00:05:45,569

MORE FACILITIES AT LANGLEY.

85

00:05:45,569 --> 00:05:49,089

THE NACA IS PROBABLY BEST KNOWN FOR ITS MANY
WIND TUNNELS – ONES THAT COULD SIMULATE

86

00:05:49,089 --> 00:05:56,999

VARIOUS SPEEDS AND ALTITUDES AND THAT RANGED
FROM SMALL MODELS TO FULL SIZE AIRPLANES.

87

00:05:56,999 --> 00:06:01,899

BUT THE NACA ALSO USED TOW TANKS TO STUDY
AMPHIBIOUS AND FLOAT PLANES.

88

00:06:01,899 --> 00:06:06,490

THE NACA ALSO PIONEERED THE FIELD OF SYSTEMATIC
FLIGHT RESEARCH.

89

00:06:06,490 --> 00:06:11,439

STARTING WITH A COUPLE OF BORROWED ARMY JN-4
JENNIES, NACA TECHNICIANS DEVELOPED THE TOOLS

90

00:06:11,439 --> 00:06:16,009

AND EQUIPMENT NEEDED TO TAKE PRECISE MEASUREMENTS
IN THE AIR – FREEING THE RESEARCH PILOTS

91

00:06:16,009 --> 00:06:17,779

FROM HAVING TO TAKE HANDWRITTEN NOTES.

92

00:06:17,779 --> 00:06:23,009

THEY USED THIS EQUIPMENT TO STUDY THE PERFORMANCE
OF AIRFOILS – WINGS – AND ALSO THE STRUCTURE

93

00:06:23,009 --> 00:06:29,800

OF AIRPLANES, TO MAKE SURE THEY DIDN'T BREAK
UP UNDER THE STRESSES OF FLIGHT.

94

00:06:29,800 --> 00:06:34,949

IN ESSENCE THE VERY SHAPE OF MODERN AIRCRAFT
IS A RESULT OF THE RESEARCH DONE BY THE COMMITTEE.

95

00:06:34,949 --> 00:06:40,449

THE FRENCH CAUDRON G-4 WAS REPRESENTED THE
PEAK OF DESIGN IN 1915 – IT WAS A PLANE

96

00:06:40,449 --> 00:06:44,599

USED BY ALL OF THE ALLIES IN WORLD WAR I – INCLUDING
THE UNITED STATES.

97

00:06:44,599 --> 00:06:49,770

BUT IN ABOUT 2 DOZEN YEARS AIRPLANE DESIGN
HAD CHANGED DRAMATICALLY – AND TO THE SHAPE

98

00:06:49,770 --> 00:06:51,199

WE ALL RECOGNIZE NOW.

99

00:06:51,199 --> 00:06:56,649

THE METAL TUBULAR BODY, ENGINES MOUNTED ON
THE FRONT OF THE WINGS, A SINGLE WING, AND

100

00:06:56,649 --> 00:06:59,009

ONE THAT IS PLACED LOW DOWN TO THE BODY.

101

00:06:59,009 --> 00:07:03,740

ALL OF THESE ELEMENTS WERE TESTED AND PROVEN
BY NACA RESEARCH IN THE 1920'S AND 30'S.

102

00:07:03,740 --> 00:07:07,830

NACA SHARED THIS RESEARCH WITH THE WORLD AND
DID ITS WORK IN PARTNERSHIP WITH INDUSTRY.

103

00:07:07,830 --> 00:07:11,330

AS A RESULT, NACA RESEARCH WAS EMBEDDED IN
THE AIRPLANE AS WE KNOW IT.

104

00:07:11,330 --> 00:07:13,069

IT IS PART OF THE DNA OF THE AIRPLANE.

105

00:07:13,069 --> 00:07:18,120

IN FACT, NACA DESIGNED WINGS WERE NOT ONLY
ON US AIRCRAFT DURING WORLD WAR II, BUT ON

106
00:07:18,120 --> 00:07:22,649
ALLIED AIRCRAFT LIKE THE BRITISH SPITFIRE,
AND EVEN ENEMY AIRCRAFT LIKE THE GERMAN FOCKE

107
00:07:22,649 --> 00:07:23,849
WULF 190.

108
00:07:23,849 --> 00:07:27,930
IN ADDITION TO INNOVATIONS IN AIRCRAFT AND
RESEARCH, THE NACA ALSO BEGAN TO TRY NEW THINGS

109
00:07:27,930 --> 00:07:31,129
WITH ITS STAFF PRIOR TO WORLD WAR II.

110
00:07:31,129 --> 00:07:35,349
IN THE MID-1930S THE NACA HIRED COMPUTERS
TO DEAL WITH THE HUGE FLOW OF DATA COMING

111
00:07:35,349 --> 00:07:38,469
FROM ALL OF THE WIND TUNNELS AND FLIGHT RESEARCH.

112
00:07:38,469 --> 00:07:42,259
THESE WEREN'T COMPUTERS LIKE WE THINK OF
THEM – THEY WERE WOMEN.

113
00:07:42,259 --> 00:07:46,869
INTERESTINGLY ENOUGH, AS LABOR SHORTAGES GREW
DURING THE WAR, THE NACA ALSO REACHED ACROSS

114
00:07:46,869 --> 00:07:50,740
THE RACIAL BARRIER AND HIRED AFRICAN AMERICAN
WOMEN TO SERVE AS COMPUTUERS.

115
00:07:50,740 --> 00:07:55,999
WHILE THIS WAS A SMALL STEP, IT REPRESENTED
A MAJOR SHIFT WITH REPERCUSSIONS THAT WOULD

116
00:07:55,999 --> 00:08:04,249
ECHO LONG AFTER.

117
00:08:04,249 --> 00:08:09,270
WORLD WAR II CHANGED LOTS OF THINGS – INCLUDING
THE PACE OF WORK AT THE NACA, AND THE KIND

118
00:08:09,270 --> 00:08:11,270
OF WORK BEING DONE AS WELL.

119
00:08:11,270 --> 00:08:14,830
VIRTUALLY EVERY AIRCRAFT FLOWN BY THE UNITED
STATES IN THE WAR WAS TESTED AND IMPROVED

120
00:08:14,830 --> 00:08:17,599
IN THE WIND TUNNELS AT LANGLEY AND AMES.

121
00:08:17,599 --> 00:08:21,759
ENGINE PERFORMANCE AND RELIABILITY WAS ALSO
RAISED TO NEW LEVELS BY WORK IN CLEVELAND

122
00:08:21,759 --> 00:08:24,159
AT WHAT IS NOW GLENN RESEARCH CENTER.

123
00:08:24,159 --> 00:08:29,309
THE CUMULATIVE EFFECT OF THIS WORK HAD A HUGE
IMPACT ON THE COURSE OF WORLD WAR II AND GAVE

124
00:08:29,309 --> 00:08:34,770
THE ALLIES AN IMPORTANT MARGIN IN ENSURING
VICTORY IN THE AIR.

125
00:08:34,770 --> 00:08:39,080
AFTER THE CONCLUSION OF TWO WORLD WARS THE
JET AGE ARRIVED AND NACA WAS AT THE CUTTING

126
00:08:39,080 --> 00:08:43,580
EDGE OF THIS TECHNOLOGY WITH FLIGHT TEST,
IMPROVEMENTS AND DEVELOPMENT.

127
00:08:43,580 --> 00:08:47,690

THE NACA ESTABLISHED A NEW TYPE OF PARTNERSHIP WITH THE AIR FORCE AND BELL AIRCRAFT TO BUILD

128

00:08:47,690 --> 00:08:51,360

A RESEARCH CRAFT AIMED AT ACHIEVING SUPERSONIC FLIGHT.

129

00:08:51,360 --> 00:08:56,100

IN 1947, AIR FORCE PILOT CHUCK YEAGER WOULD BE THE FIRST PERSON TO FLY SUPERSONIC IN THE

130

00:08:56,100 --> 00:08:57,570

BELL X-1.

131

00:08:57,570 --> 00:09:02,770

THIS WORK WON THE NACA (ALONG WITH THE AIR FORCE AND BELL) ITS THIRD COLLIER TROPHY IN

132

00:09:02,770 --> 00:09:03,770

1947.

133

00:09:03,770 --> 00:09:04,770

WITH WIND TUNNELS NOT YET ABLE TO OPERATE RELIABLY AT SUPERSONIC SPEEDS, FLIGHT TEST

134

00:09:04,770 --> 00:09:05,770

BECAME A CRITICALLY IMPORTANT TOOL.

135

00:09:05,770 --> 00:09:06,770

THE NACA, OFTEN IN COLLABORATION WITH THE MILITARY SERVICES AND INDUSTRY BUILT A SERIES

136

00:09:06,770 --> 00:09:07,770

OF EXPERIMENTAL OR "X" PLANES TO FURTHER PUSH THE BOUNDARIES.

137

00:09:07,770 --> 00:09:08,770

THE BEST AND BRIGHTEST WERE TACKLING THESE PROBLEMS AND MOVING FORWARDS TOWARDS CONQUERING

138

00:09:08,770 --> 00:09:09,770

THE HURDLES OF HIGH SPEED FLIGHT.

139

00:09:09,770 --> 00:09:14,020

BUT OTHER NACA RESEARCHERS WERE TURNING THEIR MINDS TO THE EDGE OF SPACE AND BEYOND.

140

00:09:14,020 --> 00:09:17,860

EVEN IN THE LATE 1940S, THE NACA WAS BECOMING A SPACE AGENCY...

141

00:09:17,860 --> 00:09:22,050

ONE OF THE MOST CRITICAL BREAKTHROUGHS IN THAT SPACE RESEARCH WAS MADE BY HARVEY ALLEN.

142

00:09:22,050 --> 00:09:27,210

ONE OF THE LANGLEY CADRE THAT HAD HELPED SET UP AMES RESEARCH CENTER IN 1940, ALLEN WAS

143

00:09:27,210 --> 00:09:30,900

CHIEF OF THE HIGH SPEED RESEARCH DIVISION AT AMES BY 1945.

144

00:09:30,900 --> 00:09:33,770

IN THE SUMMER OF 1952, HE DEVELOPED THE BLUNT BODY CONCEPT.

145

00:09:33,770 --> 00:09:37,640

IT HAD LONG BEEN ASSUMED THAT RE-ENTERING SPACECRAFT WOULD BE POINTED, LIKE ARTILLERY

146

00:09:37,640 --> 00:09:38,640

SHELLS.

147

00:09:38,640 --> 00:09:41,280

OR LIKE BUCK ROGERS SPACECRAFT OF THE 1930S.

148

00:09:41,280 --> 00:09:45,440

BUT, EARLY EXPERIMENTS WITH DESIGNS OF THIS

SORT PROVED DISASTROUS, AS

149
00:09:45,440 --> 00:09:49,240
RE-ENTRY VEHICLES WERE UNABLE TO SURVIVE THE
INTENSE HEAT.

150
00:09:49,240 --> 00:09:55,950
IN ANOTHER ONE OF THOSE COUNTERINTUITIVE NACA
INSIGHTS, ALLEN PROPOSED THAT A BLUNT SHAPE

151
00:09:55,950 --> 00:09:59,520
WOULD SET UP A SHOCK WAVE AHEAD OF ITSELF
AND THEREFORE KEEP THE HEAT FROM REACHING

152
00:09:59,520 --> 00:10:03,050
THE VEHICLE INSTEAD IT WOULD BE DISSIPATED
ON THE SHOCKWAVE .

153
00:10:03,050 --> 00:10:08,150
HIS 1952 PAPER ON THIS PROVED QUITE CONTROVERSIAL,
BUT SINCE THE MILITARY WAS ALSO INTERESTED

154
00:10:08,150 --> 00:10:13,760
IN THIS QUESTION FOR BUILDING NUCLEAR MISSILE
WARHEADS THE WORK WAS CLASSIFIED AND NOT WELL

155
00:10:13,760 --> 00:10:15,980
KNOWN UNTIL THE LATE 1950S.

156
00:10:15,980 --> 00:10:19,480
NONETHELESS, ALLEN AND HIS TEAM PROVED HIS
THEORIES IN THE WIND TUNNELS AT AMES AND,

157
00:10:19,480 --> 00:10:23,980
IN THE PROCESS, DEFINED THE SHAPE OF ALL SPACECRAFT
THAT FOLLOWED.

158
00:10:23,980 --> 00:10:29,070
ALLEN'S BLUNT BODY WORK WAS NOT ONLY OBVIOUS
IN THE SPACE CAPSULES OF THE 1960S, BUT WAS

159

00:10:29,070 --> 00:10:35,020

ALSO INCORPORATED INTO THE X-15, VARIOUS LIFTING BODIES, THE SPACE SHUTTLE AND TODAY WITH COMMERCIAL

160

00:10:35,020 --> 00:10:40,620

CREW VEHICLE DESIGNS OF THE CST-100 AND DRAGON CAPSULES AND THE FUTURE CAPSULE FOR DEEP SPACE

161

00:10:40,620 --> 00:10:43,200

EXPLORATION NASA'S ORION.

162

00:10:43,200 --> 00:10:50,560

BETWEEN IT'S CREATION IN 1915 AND ITS RE-CREATION AS NASA IN 1958, THE NACA'S SYSTEMATIC APPROACH

163

00:10:50,560 --> 00:10:54,770

TO "THE PROBLEMS OF FLIGHT" MADE FUNDAMENTAL CONTRIBUTIONS TO THE WORLDWIDE DEVELOPMENT

164

00:10:54,770 --> 00:10:56,240

OF AERONAUTICS AND BEYOND.

165

00:10:56,240 --> 00:11:00,490

[DRYDEN]

"THE NACA IS IN THE PROCESS OF GREAT CHANGE.

166

00:11:00,490 --> 00:11:06,682

AS YOU KNOW, THE FINAL DECISIONS ARE BEING MADE BY THE DEMOCRATIC PROCESSES OF OUR CHOSEN

167

00:11:06,682 --> 00:11:12,760

FORM OF GOVERNMENT THAT WILL RESULT IN THE ESTABLISHMENT OF A NEW AGENCY, THE NATIONAL

168

00:11:12,760 --> 00:11:21,380

AERONAUTICS AND SPACE AGENCY, BUILT AROUND THE PRESENT NACA WITH RESPONSIBILITIES FOR

169

00:11:21,380 --> 00:11:22,790
THE NON-MILITARY ASPECTS OF SPACE ACTIVITIES.”

170
00:11:22,790 --> 00:11:23,790
[NARRATOR]

171
00:11:23,790 --> 00:11:26,610
THE CULTURE THAT IS THE NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION IS BUILT UPON THE

172
00:11:26,610 --> 00:11:32,550
TENACITY AND EXPERTISE OF THOSE THAT TRANSITIONED
FROM NACA TO NASA IN 1958.

173
00:11:32,550 --> 00:11:36,110
IT'S A PART OF THE DRIVE BEHIND EVERYONE
WITH A PASSION FOR SPACE TRAVEL AND MODERN

174
00:11:36,110 --> 00:11:37,110
FLIGHT.

175
00:11:37,110 --> 00:11:44,720
DURING THE 50'S AND 60'S AERONAUTICS ENGINEERS
TRANSITIONED INTO SPACE FLIGHT DIRECTORS.

176
00:11:44,720 --> 00:11:49,930
WIND TUNNELS ONCE USED FOR AIRCRAFT TEST NOW
WERE BEING USED TO TEST BOTH ROCKETS AND AIRCRAFT.

177
00:11:49,930 --> 00:11:55,060
CENTERS OF AVIATION NOW BUILT, DESIGNED AND
TESTED SPACE CRAFT.

178
00:11:55,060 --> 00:11:57,051
CLOSE:
IN LESS THAN 70 YEARS WE AS A NATION AND A

179
00:11:57,051 --> 00:12:01,310
WORLD HAD GONE FROM A FLEDGLING MOTORIZED
FLIGHT ON A SAND DUNE IN NORTH CAROLINA , TO

180
00:12:01,310 --> 00:12:06,480
SUPER SONIC FLIGHT ABOVE CALIFORNIA'S MOJAVE
DESERT TO WALKING OUT OF A SPACECRAFT ONTO

181
00:12:06,480 --> 00:12:12,700
THE LUNAR SURFACE, THESE ACCOMPLISHMENT AND
MANY MORE REST VERY SQUARELY ON THE SHOULDERS

182
00:12:12,700 --> 00:12:16,200
OF THE MEN AND WOMEN OF THE NATIONAL ADVISORY
COMMITTEE FOR AERONAUTICS.

183
00:12:16,200 --> 00:12:21,840
NASA WAS FOUNDED IN OCTOBER OF 1958 BUT IT
WAS BORN ON THE THIRD OF MARCH 1915

184
00:12:21,840 --> 00:12:26,100
THIS LEGACY OF EXCELLENCE CONTINUES IN NASA
WHERE NOT ONLY ARE WE ON A JOURNEY TO MARS

185
00:12:26,100 --> 00:12:31,030
BUILDING ON THE LEGACY OF NACA ENGINEERS BUT
WE CONTINUE TO PUSH THE BOUNDARIES OF PERFORMANCE

186
00:12:31,030 --> 00:12:34,050
AND EFFICIENCY IN THE AIR - NASA'S WITH
YOU WHEN YOU FLY.

187
00:12:34,050 --> 00:12:35,050
[GLENNAN]

188
00:12:35,050 --> 00:12:37,500
BUT NOW WE HAVE COME TO A NEW DAY.

189
00:12:37,500 --> 00:12:43,360
NACA IS TO BECOME PART OF A NEW AGENCY, THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.

190

00:12:43,360 --> 00:12:49,381

BUT, AND THIS IS EXTREMELY IMPORTANT BOTH
TO YOU AND TO ME AS INDIVIDUALS AND TO THE

191

00:12:49,381 --> 00:12:51,620

SUCCESS OF OUR MISSION.

192

00:12:51,620 --> 00:12:58,590

NASA MUST BE LIKE NACA IN THE QUALITIES OF
STRENGTH AND CHARACTER THAT MAKE AN ORGANIZATION

193

00:12:58,590 --> 00:12:59,590

GREAT

194

00:12:59,590 --> 00:13:01,550

[KENNEDY]

WE CHOOSE TO GO TO THE MOON IN THIS DECADE

195

00:13:01,550 --> 00:13:03,490

AND DO THE OTHER THINGS.

196

00:13:03,490 --> 00:13:07,050

NOT BECAUSE THEY ARE EASY BUT BECAUSE THEY
ARE HARD.

197

00:13:07,050 --> 00:13:14,120

[ARMSTRONG]

TRANQUILITY BASE HERE, THE EAGLE HAS LANDED.