STARFLEET

SOVEREIGN CLASS STARSHIP

TECHNICAL MANUAL

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STARFLEET COMMAND

UNITED FEDERATION OF PLANETS

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This is Edition 1 version 0.2.

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About this Document

This document was created to provide fans of the Star Trek franchise a detailed technical insight into the Sovereign class starships in the Star Trek universe. It is purely fanfiction. The majority of details in this document are purely fiction of the author.

Class Introduction

Mission Objectives

The Sovereign class represents Starfleet's continued effort to satisfy the increased demand of the growing Federation for security. The Sovereign has been designed and tasked to defensive, and tactical missions.

Pursuant to Starfleet Exploration and Perimeter Defense Directive, and Federation Security Council General Policy, the following objectives have been established for a Sovereign-class Starship:

1. Perform a wide range security and tactical missions.
2. Provide capability for independent strategic actions.
3. Incorporate recent advancements and improved weaponry.

To execute these objectives, the Starfleet Spacecraft Design Advisory Commission recommended to the Advanced Starship Design Bureau (ASDB) Development team at the San Francisco Fleet Yards, to meet or exceed design goals in the following categories:

Propulsion

- Sustainable cruise velocity in excess of Warp Factor 9.0
- Local space friendly Warp drive.
- Fifth-phase dilithium controlled matter/antimatter reaction primary power system
- The impulse propulsion systems (IPS) is to be enhanced. The IPS is to provide sublight propulsion up to and including 0.92 light speed (c) with integrated subspace driver accelerators. All reactor modules to be field-replaceable.

Mission

- Sufficient sensory capacity to conduct scientific research.
- Deter or repulse threat forces

Design Life

- Spaceframe design life of approximately 100 years for an expected service life of 60 years with service life allowance of 20 percent. Major system overhaul or replacement is expected to be done for every 20 years. Continued upgrades are to be within intervals of 5 years.

General Overview

The cost and the low production number of the advanced Galaxy class had put Starfleet Galaxy Exploration Command before the problem of having a very unbalanced fleet for science and exploration. The majority of science vessel was outdated and with the growing size of the

Federation, faster and more capable ships were needed to fulfill the mission set by the Federation Council. In 2358, a study for an advanced cruiser design, which was to be cheaper to build than the Galaxy class, but as capable as possible, was initiated. In 2361, the project was approved by the Federation Council along with the Nova project. At the very beginning the design was aimed to be reminiscent of the legendary Constitution class.

Design work was nearly done when the Borg encounter in 2365 caused a change to the specifications. Like many other projects at the time, Starfleet Command requested a militarization of the ongoing designs in order to meet the Borg threat which was projected to occur in 4 to 5 years. The Sovereign project was the biggest ongoing ship design at the time. Starfleet Command decided to change the specification to a battleship with the latest military technology. Redesign was finished in 2366, and construction on the first hull begins at Starbase 12. The apparent disappearance of the Borg threat in 2367, prompted a redesign of the hasten design changes while construction of the hull continued. In 2368, the second hull was laid. Integration feedback from the Defiant project were picked up and evaluated.

The successful warp core test meant for the Defiant project prompted the adaption of a warp core with seven-lobed magnetic constriction segment columns. In 2370, the new warp core was delivered.

In 2371, the first ship the USS Sovereign NX-73811 was launched. A long list of system failures during her shakedown cruise and the following months caused her to be grounded for reconstruction. The lessons learned from her and the Defiant project would flow into the construction of the following Sovereign hulls under construction.

In the same year the lost of the Enterprise-D, moved Starfleet Command to rename the newest Sovereign class ship to be commissioned to USS Enterprise NCC-1701-E. On Stardate 49827.5 (Oct. 2372), the launch of the Enterprise from Starbase 12 went well, and she is turned over to Captain Picard's command.

Construction Chronology

Starfleet Command initiated a study in 2359 for an advanced explorer ship which was approved in 2361.

The first hull was laid in 2366 at Starbase 12. In mid 2369 saw the installation of the new impulse drive developed from the Intrepid class project. The prototype warp core was installed a year later. The Sovereign was launched in 2371. Problems with her deflector dish and IDF among others caused numerous structural damages. Months after tests she was grounded for reconstruction which will last into late 2372.

Hull Layers

Standard Federation tritanium-duranium alloy hull.

Structural Integrity Fields

The tremendous torque and stress loads during flight which the hull must sustain against are impossible without substantial reinforcement. This reinforcement is provided by the Structural Integrity Field System (SIF). The SIF applies forcefield energy directly to the spaceframe to absorb load forces on the structure.

Field generation is provided by a total of nine main and backup SIF generators. Each generator consists of a cluster of sixteen 32 MW graviton polarity generators that feed a triple of 250 millicochrane subspace field distortion amplifiers. Heat dissipation for each generator is provided by a pair of 800000 megajoules per hour continuous-duty liquid helium coolant loops.

Inertial Damping System

As with loads on the spaceframe, inertial forces act on any objects within the ship. For their protection another system had to be operated together with the SIF. This system is the Inertial Damping System (IDF). This system generates a controlled series of variable-symmetry forcefields that serves to absorb the inertial forces before affecting the crew. The IDF is a separate system from the SIF, but is fed by a parallel series of waveguides that are conducted through synthetic gravity plates.

Flux generation is provided by a total of nine main and backup field generators. Each generator consists of a cluster of twelve 1.2 MW graviton polarity sources feeding a triple of 150 millicochrane field distortion amplifiers. Heat dissipation for each generator is provided by a pair of 300000 megajoules per hour continuous-duty liquid helium coolant loops.

Ablative Armor Systems

The ablative armor system was developed by Starfleet R&D, Tokyo. This armor had been added after the Dominion War. Availability before the war prevented its use.

Command Systems

Bridge

Bridge Layout

At the very front of the bridge chamber is a large display panel. Directly fore of the command area is the helm and operations station, which faces the main viewer. At the center is the Captain’s chair flanked by the First Officer’s and Advisor’s station. Further out to the sides are the Science and Engineer’s station.

The aft wall of the bridge contains a large master systems display monitor.

Against the side walls of the main bridge are the consoles for Science, Tactical, and system control.

Access to the bridge is provided by two turbolifts. The bridge module can be ejected as a whole like other Federation ships.

Main Engineering

Main Engineering is located and divided on decks 8 and 7. Access to main engineering is provided by a two blast doors, one each on decks 8 and 7.

Computer Systems

Computer System

The computer system onboard the Sovereign class ship is one of the most advanced. The Sovereign class ship have a second generation bioneural net with bio gel packs which is 50% faster than the first generation.

Number of computer cores

There are two main computer cores from Decks 6 to 9 in the saucer section. One smaller core is on Decks 15 to 17 in engineering section.

Type of computer cores

The computer cores found on the Sovereign class ships are versions used in the Intrepid class. The processors are 60% faster than on the Galaxy class. Total processing power is 65% compared to the Galaxy class.

Core Memory

Main memory storage for the primary computer core is provided by 1800 dedicated modules of 144 isolinear optical storage chips. Under LCARS software control, these modules provide access to memory averaging around 6200 kiloquads/second. Total storage capacity of each module is about 725000 kiloquads, depending on the current LCARS software configuration.

Warp Propulsion System

Matter/Antimatter Reaction Assembly

The Warp Propulsion System is the heart of any Federation deep space starship, and at the core of the Warp Propulsion System is the matter/antimatter reaction assembly (M/ARA). The core used by the Sovereign-Class has seven-lobed magnetic constriction segment columns and multi manifolds.

Warp Field Nacelles

The warp drive of the Sovereign class is a simple design, but builds from recent advancement.

Warp Field Coils

The warp coils of the Sovereign class are smaller and compacter than the warp coils of the Galaxy class. There two sets of 28 coil pair. This allowed higher pulse frequencies for higher warp velocities.

Antimatter Storage and Transfer

All antimatter is kept contained by magnetic conduits and in compartmentalized tanks. The Sovereign class has 6 standard 300 cubic meter tanks.

Warp Propulsion Fuel Supply

The fuel supply for the warp propulsion system, or WPS, is contained within the 4 primary deuterium tanks (PDT) on deck 13 through 14. The total useable volume, which is compartmentalized against losses due to structural damage, is 10000 cubic meters (97.8%).

Impulse Propulsion Systems

Impulse Drive

The Sovereign class employs an advanced Impulse Propulsion System (IPS) derived from the Intrepid class project. The main two IPS are located in the saucer section. These drive have redesigned pulse deflectors which increase the propulsive efficiency by 170%.

Exterior Connect Hard points

The Sovereign class ship has twenty dorsal supply ports on the top engineering section

Reaction Control System

Normal flight steering control is realized by the Reaction Control System (RCS). The Sovereign class has 4 main RCS on the saucer section.

Navigational Deflector

Federation ships employ a main deflector dish for navigation and protection from collisions along the path. The Sovereign class uses a simple dish system on the bottom engineering section. One small forward fixed-focus deflector is on the top saucer.

Long Range Sensors

As the main deflector is a major emitter of both subspace and electromagnetic radiation, it can interfere with many sensors. To minimize this, the long-range sensor array is located directly behind the main deflector. This arrangement permits the long-range sensors to "look" directly through the axis of the fields.

Operational Considerations

During normal sublight operation, the navigational deflector output is at 9 MW. All three generators have to be used from Warp 9.2 on.

Tractor Beams

Grabbing, taking-in, towing or throwing is an important task in space for work. The tractor beam is all that. It performs all these tasks with the ease of a graviton beam.

The Sovereign class has one forward and one aft tractor beam emitter on the bottom engineering section. Five auxiliary emitters are aft of the shuttle bays and forward of the saucer.

Replication Systems

Transporter technology has permitted the creation of the replication system. The Sovereign class employs numerous food replicators. Sickbay employs a specially modified food replicator.

Communications

All Starfleet communications are normally encrypted. Encryption algorithms are rotated and updated on a random schedule. Away team communication may use individual starship codes. Layered encryption or combination may be used as needed in certain communication cases.

Intraship Communications

Communications aboard Federation starships occur over the optical data network (ODN) through dedicated communications subprocessors and peripheral hardware nodes. The data stream is purely holographic and based on transfer protocol (TP) decoded back into voice transmission when necessary.

Personal Communicator

Starfleet employs personal communicators for direct communication with or through onboard network systems and as small subspace radio devices offboard. These also provide identification and location for transporter operations.

Ship-to-Ground Communications

External communications can be routed by the main computer system to the radio frequency (RF) system or subspace radio as required.

Communications Hardware

The RF equipment consists of an array of ten triply redundant transceiver assemblies. These are interconnected by the ODN and electric lines. They are hull embedded, and distributed throughout the starship hull. Three each are on the saucer, and the two engineering sections.

Each assembly is a standard hexagonal casing about three meters across and one-half meter in thickness. Each one can identify and process analog or digital data and can sent them over all known radio bands. Data transfer is supported by eight six-stage variable amplifiers, signal cleaning circuits, relativistic compensator, passive ranging, and up to 400 GHz transfer rate. They are supplied by type III EPS taps. Communication range is up to 5.2 Astronomical Units (AU). The deflector dish can extend the range to 300 AU.

Ten triply redundant medium-powered subspace transceivers are available in the same arrangement as the RF array. Each device is contained within a standard trapezoidal casing measuring 1.5 x 2 x 1 meters. They are supplied by type II EPS taps with a maximum total load of 71.5 MW. The devices have additionally subspace specific components. These are electro plasma conditioners for the subspace coils, and AI controlled data switching and synchronization. Communication range is up to 60000km.

Applications

Typical external communication distances range from 38000 km to 60000 km. The subspace transceiver network is linked to the transporter system for targeting. A minimum of three transceivers are necessary for a reliable transporter lock. Transporter lock distance is limited by transporter arc resolution and local subspace.

Ship-to-Ship Communications

In most cases communication between Starfleet vessels and or installations are the most powerful when used over great distances.

This is achieved by ten standard ultra-high power subspace transceivers. Each device is contained within a standard trapezoidal casing measuring 6 x 4 x 3 meters arranged throughout the hull. A direct field energy waveguide connects the device with its antenna. In addition, the system includes warp velocity signal compensation preprocessors. Data transfer rate is at 53.45 kquads/s.

Universal Translator

Communication with unknown people requires translation. This is mostly achieved by a complex computer program called the Universal Translator. It performs pattern analysis on an unknown language and empirical interpretation to create a translation matrix. The translator is included in

all Starfleet personal communication badges and small receivers are implanted in the ear canal. A certain matrix can be uploaded from the ship database as required.

The Universal Translator has a standard database consisting of well over 100000 languages.

Transporter Systems

Transporter System Overview

Number of Systems: 13

Personnel Transporters: 4 x 6-person (Transporter Rooms 1-4)
Max Bio-Mass Payload: 1100kg (2423 lbs)
Max Range: 40000 km
Max. Beam Up/Out Rate: Approx. 130 persons per hour per Transporter
Average Safe Medical Evacuation Beam Up/Out Rate: Approx. 60 persons per hour per Transporter

Cargo Transporters: 2
Max Payload Mass: 800 metric tons. Standard operation is molecular resolution (Non-Lifeform).
Max Beam Up/Out Rate (Quantum Setting): Approx. 75 persons per hour per Transporter

Emergency Transporters: 5
Max Range: 15000 km (beam out only, range depends on available power)
Max Beam Out Rate: 140 persons per hour per transporter (total 560 persons per hour)

Limitations of Use

As powerful as the Transporters are, they do have several limitations.

- **Range:** Range is limited to 40000km by the median matter stream blooming tolerance of 0.005 arc-seconds, interstellar conditions, payload mass, and relative velocity. Emergency transporters are limited to 15000km.
- **Deflector Shield Interference:** When deflector shields are raised in their standard configuration, it is impossible to conduct transporter operations off-ship.
- **Duty Cycle:** Due to power cycling, pattern buffer cool down and reset, each system can average 1.9 complete transports per minute.
- **Transports while at Warp Speeds:** Differential warp velocities cause severe spatial distortion, making a full transporter cycle impossible. A transport is only possible at synchronized warp velocities.
- **Replication:** The Transporter holds all personnel images in a quantum-level matrix, using analog image data. Replicator technology uses molecular-level matrices, and image data is digital - much more precise, compressed, and at lower resolution. Therefore, transporters cannot use replicator data to replicate living beings.

Tactical Systems

Phasers

The Sovereign class employs Type-XII phaser emitters.

Each of the large arrays consists of numerous emitters in a dense, linear arrangement for optimal control, firing order, thermal effects, fields of fire and target impact. Each group of emitters is supplied by several EPS connections, and is interconnected through both primary and secondary fire control systems, as well as thermal management systems and primary internal sensor lines.

Phaser array arrangement:

Saucer section: 7 dorsal arrays; 4 ventral arrays

Engineering section: 3 hidden dorsal arrays; 1 ventral array; 4 pylon arrays (upgraded)

Phaser Array Output: Each Type X emitter discharges at maximum 7.2 MW. However, any numbers of emitters can fire at once in the array to combine their powers.

Phaser Array Range: Maximum effective range is 300000 kilometers. Further distances are ineffective due to time-lag during which an enemy vessel can evade.

Phaser Operations

Federation phaser arrays can be adjusted to a variety of power levels and beam types for a wide range of options. An array can fire in any number of beams up to the maximum number of emitters. Multi beams are usually used for defense against attack crafts.

Low energy beams can be used to transfer energy or as flashlight for scanning or communicating.

High energy beams are typically for tactical purposes as well as planetary surgery.

Photon Torpedoes

During the Dominion War, the standard torpedo turned out to be inadequate against Dominion vessels. The photon torpedo design was subsequently updated in the form of the Type XXV with in more space for fuel and warhead. The warhead yield rose to 18.5 isotons, although a maximum theoretical yield of 25 isotons could be achieved in the current configuration.

The standard capabilities include multi targeting and guidance, pattern spread, impact or proximity detonation, timed or self-destruct detonation, dormant mine mode, search mode or any of the mentioned in combination.

As Photon Torpedoes are semi-active weapons, the firing vector may vary within 10 degrees in any direction of the bore sight, allowing the torpedo to change the approach vector to target as necessary. If required, the torpedo may conduct immediate target tracking or acceleration as verified by sensors. For targets within 25 km, the weapon will automatically change into active mode, and accelerate away to prevent damage to the firing ship. Otherwise, active targeting will be activated 0.01 seconds or 10 km before interception point whichever is first. Should the target be elsewhere the torpedo will intercept accordingly or begin a search pattern until fuel exhaustion, upon which it will self-destruct.

With their high yield photon torpedoes are effective against attack craft formations (to a certain degree). In this case proximity detonation is recommended.

Photon Torpedo MARK XXV

Maximum Range: 4050000 Km
Current Maximum Explosive Yield: 18.5 Isotons
Theoretical Maximum Yield: 25 Isotons
Dimensions: 2.1 x 0.76 x 0.45 m
Mass: 186.7 kg

Torpedo Launcher

The Sovereign class ships use small launchers derived from the Defiant project.

Arrangement:

Saucer section: 1 turret launcher; 2 fore & 1 aft launchers (upgraded)

Engineering section: 2 fore & 2 aft launchers; 2 aft launchers (upgraded)

Payload: Approximately 300 photon and 250 quantum torpedoes.

Standard launcher firing modes:

- **Single shot:** 2.3 seconds reload-time.
- **4-5 shot:** 15.3 seconds reload-time.
- **3 shot salvo:** 3 shots are fired within 0.5 seconds with a reload time of 2 second for next two torpedoes; 15.3 next batch.

Deflector Shields

The tactical deflector shield system is the primary defensive system aboard all Federation Civilian and Starfleet Starships.

The Sovereign class ship has metaphasic shields. This shield has multiple phases at one time. Starting on Stardate 55300, regenerative shield modifications are added.

Output: There are eight shield grids on the Sovereign Class. These are supplied by nine main and backup generators of 128 MW, resulting in total shield strength of 2430 MW.

Auto-Destruct Sequence

It is a fact of serving in Starfleet that the possibility may occur that the crew may have to make the ultimate sacrifice and destroy the vessel rather than having the technology, systems, or materials to fall into threat forces possession. This process, by its very nature, is an absolute last resort for the crew to consider when all other options are exhausted. As such, Starfleet has spent a considerable amount of time, effort and energy to use computer simulations to predict any and every possible situation where the need to destroy the vessel would occur.

Environmental Systems

Life Support and Environmental Control

The most important systems for manned flight are the Life Support and Environmental Controls.

These systems maintain habitable atmospheric M-class conditions, but not limited to following characteristics:

- Concentration of atmospheric gasses
- lighting
- temperature
- humidity
- gravity

Although, the Environmental Controls keep the entire biosphere under the same conditions, the crew members can modify locally any of the variables within operational standards for that compartment.

Atmospheric System

The Sovereign class ships employ only the standard chemical systems in maintaining the ships atmosphere. The systems is triple redundant and can maintain a habitable atmosphere by itself. This system relies on perishable chemical components and must be regularly replenished.

Gravity Generation

The Sovereign class ships include standard gravity generation designs which create normal terran gravity throughout the ship. The ship is divided into two regions with its own small network of gravity generators. Each ship section has one region supported by a total of 300 generators.

Emergency Environmental Systems

A number of cryogenic oxygen storage tanks are available in addition to stored chemical batteries of various purposes and life-support.

Crew Support Systems

Crew Support

The core of the each and every starship is the crew. The success or failure of any starship falls more on the abilities of the crew than any powerful, new technology. As a result, Starfleet has a long standing tradition of attempting to provide as useful and capable amenities for their crews.

Medical Systems

Sickbay: There is one compact sickbay facility with an intensive-care ward, a laboratory, two surgical suites. Holo-emitters allow the usage of the Emergency Medical Holograph System.

Crew Quarters System

General Overview: Except for the senior officers, every crew member has to share a double room. All quarters have a chair, a table, a replicator, and one computer access terminal.

Turbolift Personnel Transport System

The turbolift system consists of vertical shafts and horizontal lines.

Recreation Facilities

There are an average number of recreation facilities.

Auxiliary Spacecraft Systems

Shuttlecraft

Type-9 Personnel Shuttle

Type: Medium short-range warp shuttle.
Accommodation: Two flight crew, four passengers.
Propulsion: Two 1350 millicochrane warp engines, two 800 millicochrane impulse engines, four RCS thrusters.
Dimensions: Length 8.5 m; beam 3.8 m; height 2.8 m.
Mass: 3.2 metric tons.
Performance: Sustained Warp 3.4.
Armament: Two Type-IV phaser emitters.

Overview: With the ever increasing need of sophisticated shuttles for medium-ranged missions it became clear that a new design was needed to fill the gap between shuttle pods and shuttles. This was realized in the type-9 shuttle design. It is able to support independently a small team on medium-range missions not requiring bigger shuttles. With warp capability it also freed the need to use bigger shuttle for medium-range transfer.

Type-11 Personnel Shuttle

Type: Medium short-range warp shuttle.
Accommodation: Two flight crew, ten passengers.
Propulsion: Two 3500 millicochrane warp engines, two 800 millicochrane impulse engines, four RCS thrusters.
Dimensions: Length 14.64 m; beam 3.26 m; height 4.5 m.
Mass: 27.2 metric tons.
Performance: Sustained Warp 4.
Armament: Three Type-IV phaser emitters.

Overview: With the ever increasing need of sophisticated shuttles for medium-ranged missions it became clear that replacements for the Type 6 & 8 are needed. This was realized in the type-11 shuttle design. It is able to support independently a small team on medium-range missions not requiring bigger shuttles.

Captain's Yacht

The Sovereign-class vessel has one yacht for the Captain at the saucer bottom.

Flight Operations

Introduction to Flight Operations

Operations aboard a Federation vessel fall under these categories: flight operations, primary mission operations, secondary mission operations, and shuttle bay operations.

Flight operations are all tasks directly related to the operation or readiness of the vessel itself.

Primary mission operations are all tasks given and supervised from the Main Bridge.

Secondary mission operations are all task not under the supervision of the Main Bridge, or just independent work.

Shuttle operations are necessary tasks which typically fall under secondary mission operations. In missions where auxiliary crafts are needed, shuttle operation has to communicate and operate to primary mission operation needs.

Mission Types

Like most Federation capital ships the Sovereign class has been designed to offer a limited multi-role ability.

- **Tactical/Defensive Operations:** Typical missions include patrolling the borders and important Federation worlds. Deployment to hostile or conflicts areas.

- **Emergency/Search and Rescue:** Aside from standard rescue missions, its primary transport ability makes it the primary responder for small-scale planetary evacuation, disaster or crisis.

Operating Modes

The normal flight and mission operations of the Sovereign-class starship are conducted in accordance with a variety of Starfleet standard operating rules, determined by the current operational state of the starship. These operational states are determined by the Commanding Officer, although in certain specific cases, the Computer can automatically adjust to a higher alert status.

The major operating modes are:

1. **Cruise Mode:** The normal operating condition of the ship.
2. **Yellow Alert:** This is a state of increased readiness for possible crisis situations.
3. **Red Alert:** This is a state of emergency, imminent danger or combat situations.
4. **External Support Mode:** State of reduced activity when docked at a starbase or other support facility.
5. **Reduced Power Mode:** Approved procedures which reduce the power usage of the ship significantly.

Cruise Mode

Cruise Mode is the standard operating condition for all starfleet vessels. During Cruise Mode, all ship's primary operational personnel are organized into three distinct working shifts of 8 hours.

Cruise Mode operational rules include:

- Level 4 automated diagnostic series are run on all primary and tactical systems at the beginning of each shift. Some systems may have more frequent diagnostics, but that is at the discretion of the Engineering Staff.

- At least one major power system is to remain active and on operational status at all time. At least one additional power system must be maintained on hot-standby.

- Long-range navigational sensors to be active if the ship is travelling and superluminal speeds. Lateral and forward sensor arrays to be maintained at ready status, although these systems can be made available to secondary scientific mission use at the discretion of the OPS manager.

- Navigational deflector to be active as needed for protection from unanticipated debris or drag from interstellar media.

Yellow Alert

Yellow alert designates a ship wide state of increased readiness for possible crisis situations. During yellow alert, all on-duty personnel and attached personnel are informed of the alert by panel display and are directed, according to their training, prepare for emergency action. The next shift personnel are directed to prepare for duty on five minutes' notice. Cross-trained second shift personnel are directed to prepare for possible duty in their secondary assignments.

Red Alert

Red alert designates a shipwide state of emergency readiness for crisis situations. During red alert, all on-duty personnel and attached personnel are informed of the alert by panel display All personnel have to report to predetermined post.

Blue Alert

The Sovereign class has not been designed for landing within a gravity well, but could maintain hull integrity for transatmospheric operations.

External Support Mode

While docked at a starbase or other support facilities with umbilical support systems the ship may go into limited activity. Systems not necessary to stay active at all times shall be deactivated. These will permit the repair, maintenance, or upgrade of all systems.

Reduced Power Mode

This mode is designed for maximum energy conservation in time of crisis, while maintaining a certain level of operational status. This is typically necessary when resources are low or when avoiding energy detection.

During Reduced Power Mode, all systems other than necessary to maintain life are shutdown completely. Life-support will be run at minimum. All non-essential areas are abandoned. Only medical replicators may be active. Emergency rations will be used. Any other systems may be reactivated periodically if necessary.

Separated Flight Mode

The Sovereign class can separate into its two sections at any time. Each section can then seek out a separate action.

Emergency Operations

Introduction to Emergency Operations

As on any Star Fleet ship the safety of the crew comes first. All key systems are triple redundant with critical systems having an additional backup. These system layers are physically separated to increase damage resilience. All safety systems offer several different technically based solutions, and offer manual operation options for each. These are also powered by an independent power source.

Fire Suppresion

The entire internal structure is augmented with fire-resistant materials pursuant to SFRA-standard 528.1(b) for inflammability in a nitrogen-oxygen atmosphere. All shipboard equipment and furnishings *must* conform to SFRA 528(c-f) classifications. Equipment and things not conforming to the requirement must be stored in specially designated storage. The Chief Engineer is ultimately responsible for the observance of these policies by all personnel.

Fire detection sensors are incorporated into the environmental sensor systems, any critical systems, and any room and stores throughout the spacecraft. These sensors are programmed to detect airborne particles or gasses typical of combustion or combustion byproducts. In the event that these sensors do not react fast enough, any crew member with a communicator or access to a communication panel can activate the fire suppression system.

In the event of a small fire, a containment force field would be erected around the fire, depriving the fire of oxygen. The computer will keep the field up until all combustible material within the field until temperatures within the field fall below combustible levels.

Larger fires may require whole compartments to be isolated through emergency bulkheads. Force fields and manned firefighting equipment would need to be used to contain the fire and prevent the spread of the fire throughout the ship.

In extreme emergencies, whole compartments can be vented to vacuum. Since this procedure would be lethal to anyone within the compartment, such venting cannot be performed until these areas are evacuated. The only exceptions to this protocol are if the Commanding Officer certifies that the fire poses an imminent danger to the whole of the spacecraft and crew.

Emergency Medical Operations

All Starfleet personnel are required to refresh their medics' skill every six month and to take part in emergency drills every month. At least one third of the crew in any department is to be trained to serve temporary as Emergency Medical Technicians, triage specialists, and other emergency medical functions. This arrangement was established due to the wide variety of emergencies at any given time.

The Sovereign class has holographic projectors on most decks and in every important area for the use of the Emergency Medical Hologram (EMH).

Lifeboats

Aside from the escape options of shuttlecraft, fighter, or transporters, the primary survival craft of the Sovereign-class is the escape pod or lifeboat. The Sovereign class has 22 escape pods.

Saucer section: 100 dorsal escape pods; 78 ventral escape pods

Engineering section: 16 ventral escape pods; 8 hidden dorsal

Each escape pods has a capacity for 8 persons. At full capacity each Lifeboat has a food supply of 168 person-days and life-support for 168 person-days.

Rescue and Evacuation Operations

Rescue and Evacuation Operations for a Sovereign class starship will fall into one of two categories - abandoning the starship, or rescue marooned starfleet personnel in shuttle or escape pods.

Evacuation/Rescue Scenario

Resources are available for rescue and evacuation to a Sovereign class starship include:

- The ability to transport 670 persons per hour to the ship via all personnel transporters.
- The availability of all shuttlecrafts and pods with a round trip of one hour to allow the evacuation of 56 persons per hour.
- Capacity to support up to 15000 evacuees with conversion of the flight bay and cargo bays to emergency living quarters.
- Ability to convert Holodecks, the observation lounges and the crew lounge to emergency triage and medical centers.
- Ability to temporarily convert aft cargo bays to type H,K, or L environments, intended for non-humanoid casualties.

Abandon-Ship Scenarios

Resources available for abandon-ship scenarios from a Sovereign class starship include:

- The ability to transport 1370 persons per hour from the ship via personnel transporter.
- The availability of all shuttlecrafts and pods with a round trip of one hour to allow the evacuation of 56 persons per hour.

- Protocols also include the use of Lifeboats. Each Lifeboat can support a full compliment for 3 weeks with food for 3 weeks.

- Environmental Suits are available for evacuation directly into a vacuum. In such a scenario, personnel can evacuate via airlocks, the shuttle bay.

Conclusion

Projected Upgrades

Mission Background

Appendix A - Technical Specifications

PERSONNEL COMPLEMENT

- Officers and Crew: 750
- Evacuation Limit: 15000

POWER PLANT

- 1500+ Cochrane warp core

DIMENSIONS

- Overall Length 685.2 meters
- Overall Draft 88.4 meters
- Overall Beam 249.9 meters

WEIGTHS

- 3255000 metric tons

PERFORMANCE

- Normal Efficiency Cruise Velocity: Warp 8
- Maximum Cruise Velocity: Warp 9.5
- Maximum Velocity: Warp 9.95 (12 hours)

ARMAMENT

- 19 Type-XII phaser arrays (3 hidden)
- 5 torpedo launchers; +5 (upgraded)

TRANSPORT

Cargo capacity: 60000 metric tons nominal;

Shuttlecraft and support craft complement (standard)

- 4 Type 9 Personnel Shuttles
- 4 Type 11 Personnel Shuttles
- 8 workbees

Transporters

- 6x6-person
- 2 cargo
- 5x4-person emergency

Appendix B - Deck Layout

Deck 1: Main Bridge, Briefing Room, Captain's Ready Room, Emergency Stores, Life support

Deck 2: Waste water recycling, Solid waste disposal, Life support, Bridge crew lounge, 1 airlock, emergency lockers, space suit lockers, System monitoring, Memory banks

Deck 3:

Deck 4:

Deck 5:

Deck 6:

Deck 7:

Deck 8: Holodecks, sickbay

Deck 9:

Deck 10:

Deck 11:

Deck 12:

Deck 13:

Deck 14:

Deck 15: upper main engineering

Deck 16: Main engineering

Deck 17:

Deck 18:

Deck 19:

Deck 20:

Deck 21:

Deck 22:

Appendix C –Analysis

The Sovereign design has some design features which should have been there from the very beginning of starship design:

- Triple bussard scopes; this is the minimum number of redundancy to cover a whole hemisphere
- Staged saucer; this is to counter the deck height problem the closer it gets to the top or bottom
- Elongated saucer; maximize volume without becoming a cube

There were and are still some features which should have been included:

- Phaser array on the pylons
- Impulse drives on the engineering sections

The basic design is lacking for the role of a battleship which was corrected in the Star Trek: Nemesis movie. However, since these were after effect corrections they do neither convince as how they were made nor seemed sensible in terms of design features.

The stated 15000 evacuation limit on the poster print is quite amazing considering how much volume there is.

Conclusion:

The basic Sovereign has about double the torpedo fire power of a Galaxy class due to the smaller torpedo tubes and quantum torpedoes if each fires 5 torpedoes.

The strength of the Sovereign lies in the new phaser arrays, quantum torpedoes, and shields. Maneuverability is not quite convincing due to RCS and mass placement.

Strategy

The best strategy would be to maneuver around to bear all her weapons on the opponent while using her better shields to take damage evenly.

Appendix D – Crew Needs

Provision

A typical human requires 0.83 kg (pure) Oxygen, 0.62 kg frozen dried food (2.48 kg with water) or 2.5 kg food, 3.56 kg water for drinking and food preparation per day. These numbers do not include extra activity consummations, water for hygienic purposes or any other usages.

Supply storage has to be provided for a year's worth for a full crew complement or 0.913 tons of raw bio matter and 3 tons of water per person or a month's worth at full evacuation capacity, whichever is more. Extensive recycling of organic material allows replicator supply to be replenished and reused up to 4 times before loses become relevant. At which point new raw material have to be supplied.

Emergency Supply

Provisions have to offer at least 10000 kJ per person per day in dry form with a shelf life of at least five years. A three day package measures 17.5x15x7.5 cm^3 and weights about 1.5 kg. After each meal some water has to be drunk in order to help digestion.

Provisions have to offer 1.5 l of water per person per day.

Recommended rationing: For marine or space conditions rations can be lowered to one third. For land conditions rations can be lowered to one half. During the first 24 hours do only drink when really necessary. Afterward, do not drink more than 0.5 l per day. When supply is nearly exhausted one may drink only 1/10 l per day. Children usually drink 1 l per day. Their rationing should be more lenient.

Appendix E – Reference Ships

Galaxy class

Accommodation: 1012; 15000 evacuation
Dimensions

- Overall Length: 641 m
- Overall Height: 463.73 m
- Overall Beam: 195.26 m

Mass: 4960000 metric tonnes
Performance

- Normal Cruise: Warp 6

- Maximum Speed: Warp 9.6 (12 hours); Warp 9.9 upgraded (12 hours)

Armament

- 11 Type-X phaser arrays
- 3 photon torpedo launchers, 10 torpedoes burst fire, 275 torpedoes

Bibliography

References:

Star Trek: The Next Generation Technical Manual by Rick Sternbach and Michael Okuda. Pocket Books, a division of Simon & Schuster Inc. 1230 Avenue of the Americas, New York, NY 10020.
ISBN-10: 0671704273; ISBN-13: 978-0671704278

Star Trek: Deep Space Nine Technical Manual by Herman Zimmerman, Rick Sternbach, and Doug Drexler. Pocket Books, a division of Simon & Schuster Inc. 1230 Avenue of the Americas, New York, NY 10020.
ISBN-10: 067101563X; ISBN-13: 978-0671015633

Star Trek: The Next Generation U.S.S. Enterprise NCC-1701-D Blueprints by Rick Sternbach. Pocket Books, a division of Simon & Schuster Inc. 1230 Avenue of the Americas, New York, NY 10020.
ISBN-10: 0671500937; ISBN-13: 978-0671500931

Afterward

Authors Notes

My interest on the Sovereign was limited at first as she seemed rather not as esthetic as the Galaxy class, although it was nice finally to see some sensible design features in starship design. This document was created as an extension to the generic database.

Ships of the Line

USS Sovereign NCC-73811
USS Enterprise NCC-1701-E

USS