FOUR SIMULATIONS OF WORLD WAR I
Under Varying Military-Technical Conditions

February 21, 2010

For students and for teachers contemplating using this simulation: One major theoretical issue in international politics is the relative impact of internally-generated policy preferences compared to that of external structural incentives and constraints. These simulations allow students to experience this tension directly by playing a simple game of World War I four times – each time with exactly the same preferences, reflected in the 'points' that each country gets for achieving certain objectives, but each time facing different structural pressures, represented by small rules tweaks that represent different military-technological conditions.

The first game uses rules that make conquest relatively easy; the 2nd makes it harder by simply changing the number of 'divisions' of troops needed to roll one die in battles. These are intended to correspond in general flavor – the simulation is too simple and abstract to claim more than 'flavor' – to pre-World War I 'Cult of the Offensive' expectations and to the actual conditions of that war, dominated as it was by machine guns, barbed wire, etc. The 3rd and 4th simulations introduce first nuclear weapons and then strategic defenses. Of course these did not exist in 1914; we use the same, map, political objectives, and rules (on all other points) so as to preserve comparability to the first two simulations.

I exhort students to "use just ¼ of your conscious mind to play the game, and the other ¾ to observe yourself playing the game" – to take note of the decisions they make and what considerations seem to them most important as they make those decisions.

Of course, the importance of domestic versus structural pressures on real-world decision makers varies from one issue area to another and from every decision to every other. The students who have participated in this simulation, however, always report themselves very satisfied that they have gained some insight into how such tradeoffs work.

I have found that the simulation stimulates student interest in a variety of historical, theoretical, and policy issues, for instance arguments about the causes of World War I, identity as a source of foreign policy (are identity-based policies more or less subject than others to structural constraints), and the rise of China (should U.S. policy be based mainly on assessments of structure or assessments of possible Chinese aggressive intentions—the majority, even after the simulations, say 'intentions'). In anonymous evaluations, almost all students report the simulation as the most instructive element of the course.

Practical issues: I devote the day before the first simulation to "level of analysis" issues, assigning works such as Jervis' "Cooperation under the Security Dilemma" and Putnam's "Logic of Two-Level Games." The game is played by six teams of players, one for each major power; it is feasible up to a class size of about 40. The map is best drawn on a blackboard, using white chalk for boundaries and different colors for each country's troops. A historical map printed on paper can be used together with colored pencils (two 11" by 17" sheets taped together to make

22" x 17" is best), but the constant erasures as troop levels change can be a chore. About 20 each of 6-, 8-, and 10-sided dice are needed; these can be had at any game store.

Each simulation usually requires two 75-minute class periods, although the 3rd and 4th can often be finished in one because students rarely resist the temptation to try out their nuclear arsenals – even though they fully realize that this is almost never in their countries' interests. Even in such cases, after-action discussions show that most students nevertheless develop good understandings of the implications of the nuclear revolution as well as of the special implications of strategic defenses.

SIMULATION RULES

These game rules allow conducting a simple simulation of World War I. The game is played in six teams, representing the six major European powers in 1914 (the United States is represented only as extra forces for Britain late in the game).

The simulation is designed to be played four times. All four games use the same scenario – the same geography and the same assumptions about national political goals. The only differences are changes in military technology.

The rules are intentionally oversimplified. A very simple map, drawn on the blackboard, is used (Denmark, the Netherlands, Switzerland, Spain, Montenegro and Albania are neutral and should be shaded out; also, there should be no land border between Russia and Turkey). Each 'turn' in the game represents one year. Each 'division' of troops represents – very approximately – one actual division of 10,000 to 15,000 men.

Purpose. This simulation is not really about World War I, but about the impact of structure on states' foreign policies, where "structure" can be defined as any kind of externally imposed incentive or constraint that decision makers cannot change within the time frame in which they have to make a decision. As you play the game, devote only part of your attention to your strategies as you play. Use the rest of your attention to **watch yourself playing the game**, so that you can assess whether—and how—structure impacts your strategic thinking in the game. In addition, I ask you to try to remember, from one simulation to the next, how your strategic thinking in one game compares to earlier games that had different structural conditions.

I. Simulation #1: 'The Cult of the Offensive'

Situation. The game begins in 1914. Europe is divided into two competing alliance systems: the 'Triple Entente,' which includes France, Russia, and Britain, and the 'Triple Alliance,' which includes Germany, Austria-Hungary, and Italy.

In the game, countries may not fight against their allies (although they need not support them). Italy, which had *de facto* withdrawn from the Triple Alliance by this time, is an exception. Italy may attack, or be attacked by, either side. Once in the war, however, Italy may not change sides.

II. Objective. Achievement of national objectives is measured in terms of 'Political Points' which are awarded (or charged) for different decisions and events. Countries receive points for avoiding war (representing the normal growth of peacetime economies), and lose points for each year at war with one or more major powers (representing the economic and human costs of war) and for being defeated in war. Countries may also gain points for defeating certain enemies or lose them if allies are defeated.

A score greater than 0 is considered, on balance, a victory; the country's position has improved compared to the prewar status quo. Less than zero is a defeat, meaning that the country has ended up worse off than the original status quo.

Each country's national objectives (preferences) remain the same for **all four** games. This allows you to measure how much your behavior changes with constant preferences but varying structure.

All countries:

Each year at peace, not mobilized:	+10
Each year at peace, partially mobilized:	+5
Each year at peace, fully mobilized:	0
Each year at war with a major power:	-10
Defeated in war:	-100

Political Points Received By:

For defeat of:	Germany	Austria	Italy	France	Russia	Britain
Germany	-100	-50	0	+50	+40	+40
Austria	-50	-100	+40**	0	+40	+10
Italy	0	+20	-100	+20*	0	0
France	+40	0	+20**	-100	-50	-50
Russia	+40	+50	0	-50	-100	-30
Britain	+40	0	+20*	-40	-30	-100
Belgium	+10*	0	0	+10*	0	0++
Serbia	0	+40	0	0	0**	0
Romania	0*	+10*	0	0	+10*	0
Bulgaria	0	0	0	0	0+	0
Turkey	0*	0*	0	0	+20+	+10++
Greece	0	0	+10*	0	0**	0**

  * = -10 if defeated by the other side.

  ** = -20 if defeated by the other side.

  + = -10 if defeated by any other major power, even if on the same side.

  ++ = -20 if defeated by any other major power, even if on the same side. +10 if never conquered or if conquered by other side and then liberated.

III. Set Up.   At the start of the game, each country's forces are deployed according to their pre-war mobilization plans, some along the 'fronts' (borders) separating their country from opposing countries (i.e., the border between France and Germany is one front, while the Belgian-German border is another), and some in reserve.

Germany:		Austria:	
Russian border:	20	Russian border:	25
French border:	40	Serbian border:	20
Belgian border:	50	Italian border:	10
Reserves:	10	Reserves:	10

France:		Russia:	
German border:	40	German border:	25
Belgian border:	10	Austrian border:	40
Italian border:	10	Romanian border:	10
Reserves:	10	Reserves:	10

Great Britain:		Italy:	
Reserves:	6	French border:	10
		Austrian border:	10
		Reserves:	10

Minor Countries:			
Belgium:	6	Serbia:	12
Greece:	6	Romania:	6
Turkey:	18	Bulgaria:	6

WARNING! Two major powers, France and Austria, can be defeated on the first turn. Study your deployments and consider adjustments.

IV. Procedure. The game is played in a number of 'turns,' each representing one year of actual time. The first year is 1914. Actions within each turn are conducted in a certain order:

Game Turn Sequence of Actions
1. Diplomacy (the game director will usually allow about 5 minutes; longer for the first turn).
   Countries conduct diplomatic discussions with each other. Then:
    -Major powers at war with each other may make peace if both agree.
   -Major powers may halt wars against minor powers if the other side has not intervened.
   -Major powers may declare war on other major powers or minor countries.

2. Land operations.

Countries plan and write down movement of land forces (the director will allow 2-3 minutes).

Land forces move.

Land battles are resolved.

Determine whether any countries have been conquered.

3. Nuclear war (Simulations #3 and #4 only).

Countries simultaneously plan nuclear strikes.

Attacks on submarines (SSBNs) are resolved.

Attacks on strategic defense systems are resolved.

Other nuclear strikes are resolved.

Repeat these four steps as necessary.

Determine whether any countries have been eliminated by nuclear damage.

4. Production

Countries at peace choose production levels.

New forces are added.

5. Adjust political point scores

IV.A. Declarations of War (or Peace).   Any major powers(s) which are at war may agree to make peace. A major power may only make peace if ALL of its major power opponents agree. A power MAY make peace separately from its own allies. Major powers which make peace may not go to war again for the remainder of the game.

Each major power may declare war on any opposing major power(s) and/or any minor country or countries. Countries may only declare war on major powers of the opposing alliance (e.g., Germany cannot attack Austria). Either side may attack or be attacked by Italy.

Declarations of war are made openly and sequentially (once one country declares war, other countries have an opportunity to respond with declarations of their own).

IV.B. Movement. Each turn, each country may move some of their divisions. Divisions may be moved from reserve to one or more fronts, or from one front to another. The number of divisions each country may move each turn is limited by their railroad capacity:

Germany: 65 (15)   Austria: 35 (5)

France: 60 (20)   Russia: 50 (0)

Great Britain: 50 (6)   Italy: 35 (0)

Belgium: 60 (NA)   Other minor countries: 30 (NA)

Due to terrain and to supply limitations of European road and rail networks, there is a limit to the number each side may deploy to a single front (even if the troops belong to more than one country):

Most fronts	60 divisions/side
Franco/Italian front	45 divisions/side
Balkan borders[1]	30 divisions/side

In peacetime, divisions may only be deployed to home country fronts (e.g., German divisions may be deployed to any of Germany's borders, but not to any of Austria's borders). In wartime, divisions may be deployed to any front which they can reach by crossing friendly-controlled territory (e.g., once Belgium has been conquered, German units could be deployed to the Belgian-French frontier).

All movement is done simultaneously and secretly, by writing on paper.

IV.B.1. 1914 (Special). On the first turn of the game, each country's rail capacity is limited to the numbers shown above in parentheses (some mobilization has already taken place).

IV.B.2. Assistance to Friendly Major or Minor Powers. Once at war, divisions may be sent to any front controlled by a friendly power (e.g., German units could be placed on the Austrian-Russian border). However, divisions moved into, out of, or through the territory of another country count against the rail capacities of **both** countries.

Moving into, out of, or through the territory of a conquered major country also counts against the rail capacity of both the moving power and the defeated power.

No assistance may be sent to **minor** countries on the first turn that they are attacked. If they survive the initial attack, the opposing alliance may then send troops to assist them.

IV.B.4. Sea Transport (Special). Britain is an island, and so has no fronts (which means that it cannot be conquered in Simulations #1 or #2). Britain may move divisions by sea, land, or a combination. If they move into, out of, or through the territory of an allied power, then they also count against that country's rail limit.

IV.B.5. Amphibious Invasions (Special). Britain may attempt amphibious invasions against Greece or Turkey (the coast defenses of Belgium, Germany, Italy, and Austria were too strong to permit an opposed landing). A maximum of 15 divisions may participate in the first turn of an amphibious invasion. If an invasion is initially unsuccessful, surviving British divisions remain in place on that country's coastline and another 15 divisions could be sent per turn (or the divisions already there could be withdrawn). Divisions moved this way count double against Britain's movement capacity.

Once the target country is conquered, British forces may enter or leave it normally.

---

[1]. Borders between any two of Serbia, Greece, Bulgaria, Romania, and Austria-Hungary.

IV.C. Battle. Wherever opposing sides have forces on the same front, either side may attack (the side with more divisions on that front has the first choice). If either side does attack, a battle occurs.

IV.C.1. Reserves. The defending side in a battle on one of their own home country fronts (not anywhere else)[2] may immediately move up to 10 divisions from reserves, if they have them, to the threatened front. They may do this even if they had zero divisions deployed on that front before sending reserves. This move does not count against normal rail capacity limits.

IV.C.2. Battle Resolution. In each battle, each side rolls one 6-sided die for each 6 divisions they have in the battle. The total rolled on all the dice is the number of enemy divisions destroyed (e.g., if the Germans have 48 divisions on the Belgian-French front, they roll eight dice; if the total is 27, that means that 27 French divisions are destroyed).

IV.C.3. Conquest. If all enemy divisions on a front are destroyed, that enemy country is defeated and may be occupied (e.g., if Austria destroys all Serbian divisions on the Austro-Serbian front, Serbia is defeated). When a country is defeated all of its forces are dissolved and its territory is controlled by the other side, which may move forces into it on the next urn.

IV.C.4. **Rapid Advance.** If a major power conquers a minor country on the **first** turn that that minor country is in the game, the victorious divisions may immediately advance across the minor country to attack an adjacent country (if the attacker is already at war with that country). If the victorious force rolled more 'kills' than needed to destroy the initial defending force, the excess may be applied against the new opponent.

An example may help make this clear: suppose that 48 German divisions attack 6 Belgians on the German-Belgian border. The Belgians destroy 2 German divisions. For their part, the Germans roll 29 'kills.' The Belgians are eliminated, and the surviving German divisions may now advance across Belgium and attack the (say) 25 French divisions on the Franco-Belgian frontier. In this new battle, 23 French divisions are destroyed (29 minus 6 already used to destroy the Belgians). The French roll four dice, destroying 11 German divisions.   If there had been 23 or fewer French divisions on this front France would have fallen.

IV.D. Production. At the end of each turn, each country may mobilize additional divisions. Countries at peace may choose any of three approaches to building up their forces:

1) Normal peacetime budgets (no accelerated mobilization);
2) Moderately paced rearmament (some additional financial and manpower effort); or
3) Accelerated mobilization (maximum possible peacetime effort).

Decisions are made simultaneously and secretly by writing on paper. Countries that choose Option #2 forfeit half of the Political Points bonus for being at peace (+5 instead of +10); countries which choose Option #3 forfeit all of it (+0). Countries at war with a **minor power only** must choose Option #3.

---

[2]. Building and rail and telegraph networks and optimizing their use for troop movements takes years.

Each country at war with a **major power** receives additional forces according to the number of years it has been at war. These numbers tend to decline over time as manpower reserves are exhausted and national economies and political systems come under increasing stress (continued strong British mobilization late in a war represents Commonwealth and American contributions). New divisions are added to each country's reserves.

Production	Germany	Austria	Italy	France	Russia	Britain
Peacetime						
Not Mob.	10	5	5	7	15	0
Partial Mob.	25	10	10	15	25	5
Full Mob.	40	15	15	25	35	15

        (or at war with a minor power only)

	Germany	Austria	Italy	France	Russia	Britain
At War with a Major Power						
First Year	60*	30	20	40	60**	20
Second Year	50*	15	20	25	50**	20
Third Year	45*	15	15	20	35**	20
Fourth Year	35*	10	10	20	20**	30
Fifth Year	20*	5	10	15	10**	30

        * = -10 if at war with Britain (due to naval blockade).

        ** = -10 if at war with Germany (due to naval blockade), unless Russia or one of her allies controls Turkey.

Minor Countries

      Minor countries at war receive 1 division for each 6 that the country started with.

      V. End of the Game. The game ends when all major powers are at peace with all countries (including minors), or when all major powers on one side have been conquered. At this point victory point scores are totaled to determine who (if anyone) has won the game.

      VI. Machine Guns (Simulation #2). Identical to Simulation #1 except that instead of both sides rolling one die for every 6 divisions, the attacker in each battle rolls one die for each 7.5 divisions while the defender rolls one for every 5. (This shifts the casualty exchange ratio from 1:1 in the first game to 1.5:1 in favor of the defense.)

      VII. Nuclear Weapons (Simulation #3). Each country receives, in addition to its conventional forces, a number of strategic nuclear weapons. We retain the map and political scenario of 1914, however in order that the military-technical change will be the **only** change in the game. *Note:* This game uses a set of assumptions meant to be conservative; i.e., we will

model a situation in which offense in general, and nuclear counterforce in particular, are somewhat easier than they probably are in the real world.

VII.A. Conventional War. Use the rules from Simulation #1.

VII.B. Nuclear Forces. In addition to land forces, each major power also begins with a number of land-based stregic nuclear missiles (ICBMs) and a number of ballistic missile submarines (SSBNs):

Country:	ICBMs/SSBNs:	Country:	ICBMs/SSBNs:
Germany:	36/3	France:	24/2
Austria:	24/2	Russia:	24/2
Italy:	12/1	Britain:	36/3

Each ICBM has 10 nuclear warheads. Each SSBN carries 4 missiles with 10 warheads each – a total of 40 warheads per submarine.

VII.C. Nuclear War. After all land battles for each turn have been resolved (see pp. 4-5), major powers may use their nuclear forces to attack each other.

Nuclear strikes are **not** restricted by earlier declarations of war. Any major power may launch nuclear attacks on any country of the other alliance (if not already at war, this action constitutes a declaration of war). The usual special options and restrictions apply to Italy.

VII.C.1. Nuclear Attack Procedure. Nuclear attacks are plotted simultaneously and secretly. Allies may **not** consult with each other at this time.

Nuclear missiles may be targeted at enemy cities; or enemy ICBMs; or enemy divisions in reserve; or at enemy divisions on the border between any two countries. Whenever a missile is fired, all its warheads must be fired at the same category of target. Whenever a submarine fires its missiles, it must fire all its missiles at once (in effect, the submarine is out of the game).

Once all nuclear attacks are plotted, they are all resolved simultaneously.

VII.C.2. Anti-Submarine (ASW) Attacks. At the same time that nuclear attacks are plotted, each country may also choose to use its naval and air antisubmarine forces (ASW forces) to attack enemy missile submarines of enemy countries. These forces are not represented directly in the game; all the attacking country has to do is simply declare which countries' submarines it will attempt to attack.

Whenever any power attacks any other power's submarines, roll a 10-sided die for each target; each roll of '1' destroys a submarine. More than one power can attack the same enemy fleet simultaneously.

Missile submarines destroyed by ASW attack are lost **before** they can fire their missiles.

VII.C.3. Nuclear Attacks on Cities. To do this, simply designate the number of warheads targeted on enemy cities. The target major power gets -5 Political Points for each warhead.

VII.C.4. Nuclear Attacks on Land Forces. For each 10 warheads fired at land forces, roll one 6-sided die to determine the number of divisions destroyed.

In addition, for each warhead fired at reserve divisions, the target major power gets -1 Political Point (due to collateral damage from fallout, etc.). If missiles are fired at divisions deployed along a border, then for each warhead fired the major powers on **both** sides of that border get -1/2 Political Point each.

VII.C.5. **Nuclear Attacks on ICBMs.** To do this, designate how many enemy missile silos will be attacked and how warheads will attack each silo, up to a maximum of 5 warheads per target. (It is difficult to time nuclear attacks so that later warheads attacking the same target are not destroyed by having to fly through the explosion of the first one, called 'fratricide').[3]

If the target major power has also fired some of its ICBMs during the same round, then attacking warheads are randomly assigned among all silos which contained missiles at the **start** of the current round (in other words, when two powers both fire their missiles at essentially the same moment, both run the risk that some of their attacking warheads will wind up attacking 'empty holes' whose missiles have just been fired). Silos whose missiles were fired in previous rounds are ignored.

Each warhead targeted on a silo which contains an actual ICBM has an 80% percent chance of destroying the target missile (a roll of 1-8 on a 10-sided die).

An example may help: Suppose that France targets 5 missiles (50 warheads), against German missile silos. Germany had 36 ICBMs at the start of this round, but fired 4 of them at the same time France attacked. Since 32 out of 36 (or 89%) of the German silos still contain missiles, we assume that 89% of the French warheads (or 44 out of 50) actually attack silos which still contain missiles, so 44 warheads attack 32 silos. France allocates 1 warhead against each German silo (32), plus a 2nd warhead against 12 of them (32+12=44). So for the first 20 silos France rolls one 10-sided die against each, and destroys, say, all but 5 of them; against the remaining 12 silos France rolls 2 dice against each, and destroys, say, all of them (note that these 'double attacks' would fail only if France rolled a 9 or 10 on **both** dice. So only 5 of the 32 unfired German ICBMs survive.

In addition to all other effects, for each warhead fired at ICBMs, the target major power gets -1 Political Point for collateral damage.

---

[3]. From 1969 through the 1990s U.S.-Russian arms control talks assumed that the maximum that you could target on one silo was 2 warheads—1 airburst and 1 groundburst. More recently, however, Kier Leiber and Daryl Press pointed out that descending warheads would be moving so fast (5,000-10,000 m.p.h.) that even a few seconds separation could equate to 10 miles or more. They estimated that, with careful timing, an attacker could use at least 4 airbursts against the same target and perhaps more.   Lieber and Press, "The End of MAD? The Nuclear Dimension of U.S. Primacy," *International Security* 30:4 (Spring 2006), 7-44.

VII.C.6. Multiple Nuclear Attack Rounds. There may be any number of rounds of nuclear attacks in the same game-turn. Once nuclear war starts, it continues through as many rounds as necessary until no major power wants to launch any more missiles. Only then does the game progress to the Production phase and to the next game-turn. (This is because nuclear strikes are so quick compared with the progress of land wars – typical ICBM flight times between the U.S. and Russia are about 30 minutes – that there is essentially no limit to how many rounds of nuclear strikes there can be in the time that it takes a land army to advance any noticeable distance.)

VII.C.7. Conquest.   The regular conquest rules (IV.C.3) are modified in three ways:

1) If, due to a combination of conventional battle and nuclear attack, all divisions on *both* sides of a border are eliminated, then neither country is conquered.

2) If a major power loses 100 or more Political Points due to nuclear strikes, it is considered defeated at the end of that turn. If a major power is defeated by nuclear strikes, opposing powers score only half the usual Political Points for defeating it (the enemy has been removed as a threat, but no resources can be gained from occupying it).

3) Even a defeated major power can still launch nuclear strikes in additional 'rounds' of the same turn it was defeated if it still possesses any missiles.

VII.D. Production of Nuclear Forces. During production each year, at the same time that land reinforcements are added, each major power receives a number of new ICBMs:

Production	Germany	Austria	Italy	France	Russia	Britain
Not mob.	4	2	2	3	3	4
Partial mob.	8	4	4	6	6	8
Full mob.	12	6	6	9	9	12

 or at war with a major power.

Note that ICBM production is not affected by the drying up of manpower pools as a war drags on. In addition, for each 12 ICBMs that a country receives, it also receives one ballistic missile submarine (SSBN).   For some countries, it may sometimes be necessary to keep track of "partial" SSBNs until a complete one has been finished.

Notes on Simulation #3: While this game is intended to reflect something roughly like the existing superpower nuclear balance, it is intentionally biased in favor of nuclear counterforce (first strikes) and against retaliatory capabilities (second strikes) in several ways:

1. Each country begins with 75% of its strategic nuclear warheads on highly vulnerable ICBMs, compared with about 20% for the U.S. today and less than 40% for Russia.

2. The rules assume that satellite and other intelligence capabilities are not degraded by nuclear war. Attackers always know which enemy ICBMs were fired in previous rounds, although they do not know which, if any, may be fired simultaneously with their own strikes.

3. Multiple warheads targeted on the same silo are allowed (we assume that the 'fratricide' problem can be at least partly solved).

4. We accept the highest estimates of ICBM reliability and accuracy.

5. The rules treat attacks on missile submarines (strategic ASW) as fairly effective, even over quite short periods of time. This not the expert consensus.

6. 'Launch on warning' strategies are not allowed.

7. Unconventional delivery means for retaliation (smuggling, etc.) are not allowed.

VIII. Strategic Defenses (Simulation #4). In addition to their land forces and offensive nuclear missiles, each major power is assumed to possess an integrated strategic defense system. The representation of this system is highly abstract. Although each countries' system is considered to consist of 5 critical sites, the game does not specify whether these represent detection systems, spaced-based weapon platforms, or ground-based anti-missile sites.

VIII.B. Nuclear War. Nuclear war is resolved in the same way as in Simulation #3, with the following changes:

VIII.B.1. Nuclear Attack Procedure. All nuclear attacks are still plotted simultaneously and secretly. The only difference is that enemy strategic defense sites may be targeted in addition to cities, troops, and ICBM silos.

VIII.B.2. Anti-Submarine (ASW) Attacks. No change from Simulation #3.

VIII.B.3. Effects of Strategic Defenses. Whenever a nuclear warhead is fired at a major power which possesses any intact strategic defense sites, the target major power has a chance of shooting down the attacking warheads before they can reach their targets.

If the attacking warheads are targeted at the defender's cities, reserve divisions, or ICBMs, the chance that each warhead will be shot down is 10% if one strategic defense site is active, plus 20% for each additional site which is active (up to a maximum of 90% if all five are active – a roll of 1-9 on a 10-sided die).

If the attacking warheads are targeted at divisions deployed on a border of the major power, the chance that each warhead will be shot down is 10% times the number of active strategic defense sites (50% if all five are active; 1-5 on a 10-sided die).

Strategic defenses cannot defend troops located in other countries.

Finally, if the attacking warheads are targeted at a strategic defense site, the site always has a 90% chance of shooting down each attacking warhead.

VIII.B.4. Attacks on Strategic Defenses. Designate how many enemy strategic defense sites will be attacked and how many warheads will attack each site. There is no limit to the number of warheads which may be targeted against each site, but no more than 2 warheads (if more than 2 survive interception) may actually attack each target. Each surviving warhead has a 90% chance to destroy the strategic defense site.

Attacks on strategic defenses are resolved **after** attacks on submarines but **before** all other nuclear attacks.

Example: Suppose that Russia launches a nuclear strike on Austria, which has an intact strategic defense system (all 5 sites are active). Russia launches 6 missiles, with 30 warheads, against the strategic defense system, and 6 missiles with 30 warheads at other targets such as cities and ICBMs. 6 warheads are targeted against each of the 5 strategic defense sites, which shoot down 6, 6, 5, 5, and 4 attacking warheads respectively. Sites #1 and #2 survive automatically, while sites #3, #4, and #5 are attacked by 1, 1, and 2 surviving attacking warheads. Let us say that all three are destroyed. Since 2 sites survived, Austria will have a 30% chance of shooting down each of the attacking warheads aimed at other categories of targets.

VIII.B.5. Effects of Strategic Defenses on Collateral Damage. Target countries suffer no Political Point penalties for attacking warheads which are shot down by strategic defenses.

They suffer the normal -1 Political Point penalty for warheads which get through against cities, silos, or troops, or against a strategic defense site.

VIII.C. Repair of Strategic Defenses. Strategic defenses do not increase during the game, but during production each year each major power is assumed to repair (or replace) all strategic defense sites which may have been lost during the year. Thus all major powers always begin each year with an intact strategic defense system.

Notes on Simulation #4: This game reflects a somewhat optimistic view of the possible capabilities of strategic defenses in a number of ways:

1. 90% interception probabilities are relatively optimistic compared to the expert judgment concerning the state of the art or to U.S. experimental tests. Some experts and advocates foresee near-perfect performance someday, but the weight of opinion is against this.

2. Strategic defense systems are assumed to degrade gracefully. For instance, the simulation does not include any critical detection or command-and-control sites whose loss would undermine the whole system.

3. The most obvious countermeasures to strategic defenses, such as the use of large numbers of dummy warheads, or evasive maneuvering by attacking warheads, are not allowed.

4. Unconventional means of attacking strategic defense systems are not allowed.

5. Strategic defenses are assumed to be easy to repair or replace, even during a nuclear war.

NUCLEAR WAR POLITICAL POINT LOSS SUMMARY:

Attacks on submarines	0
Warheads shot down by strategic defenses	0
Warheads targeted on cities	-5 each
Warheads that attack ICBMs, strategic defenses, or reserve troops	-1 each
Warheads that attack troops on either side of a major power border	-½ each
Warheads that attack troops in minor countries	0